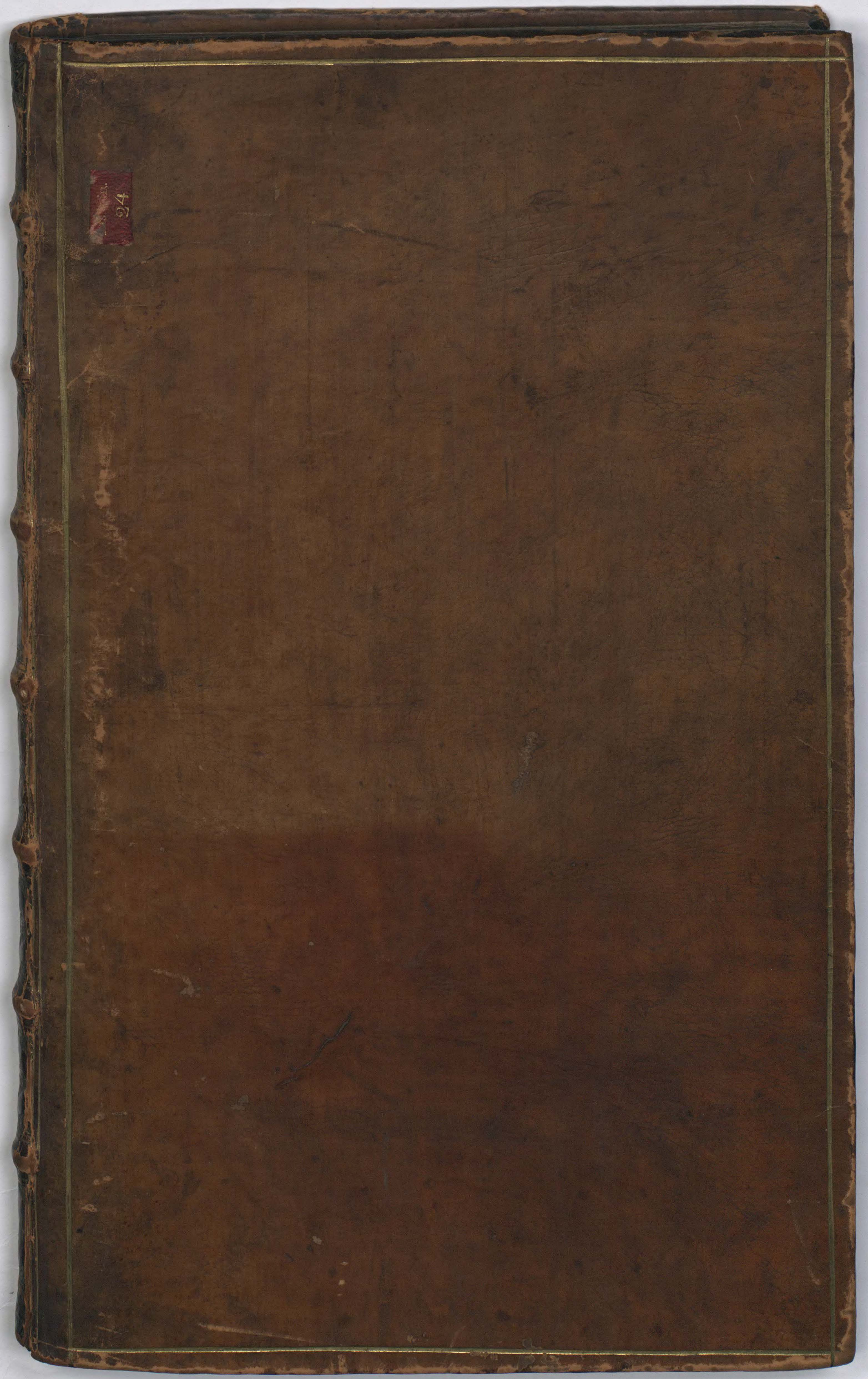
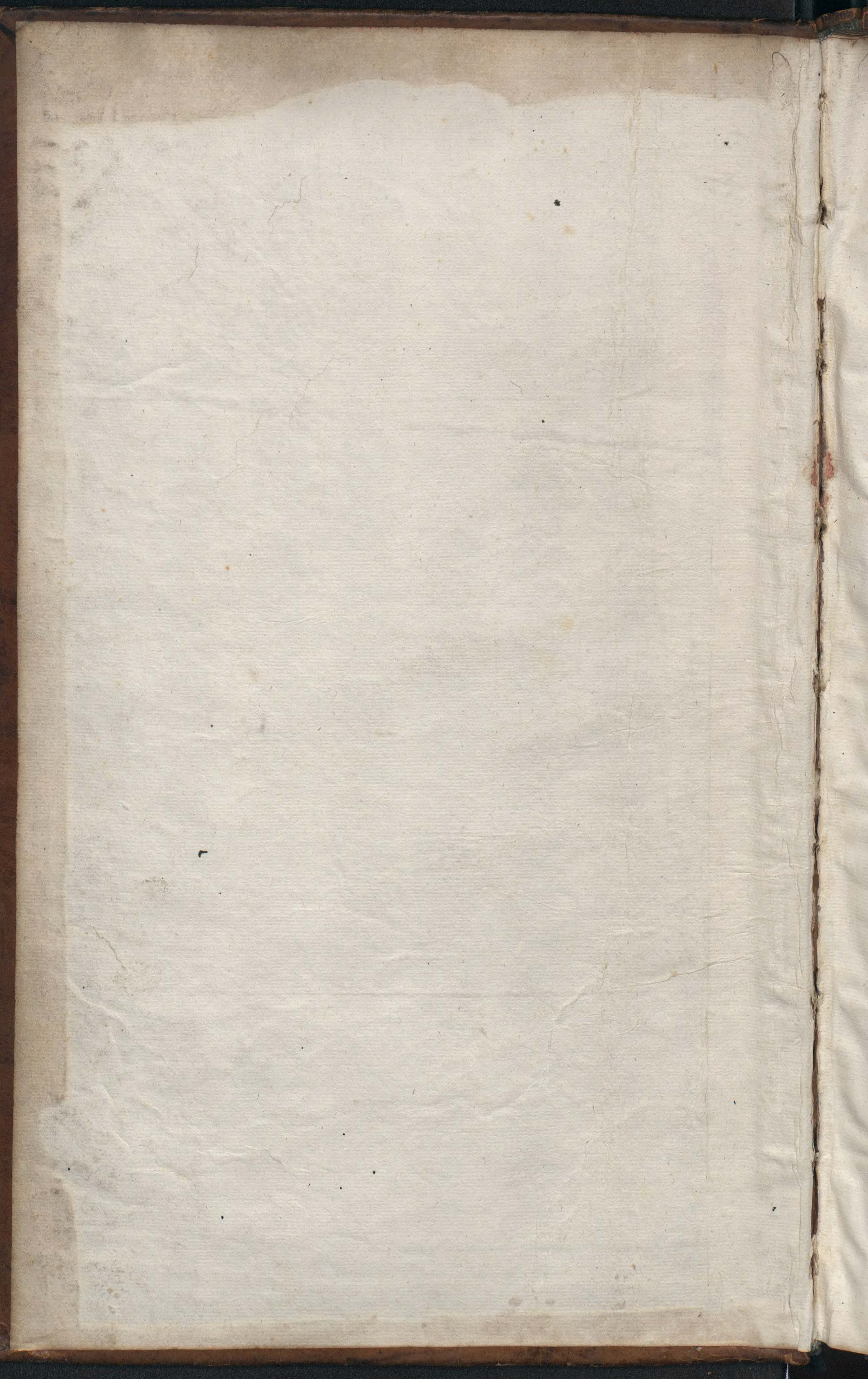
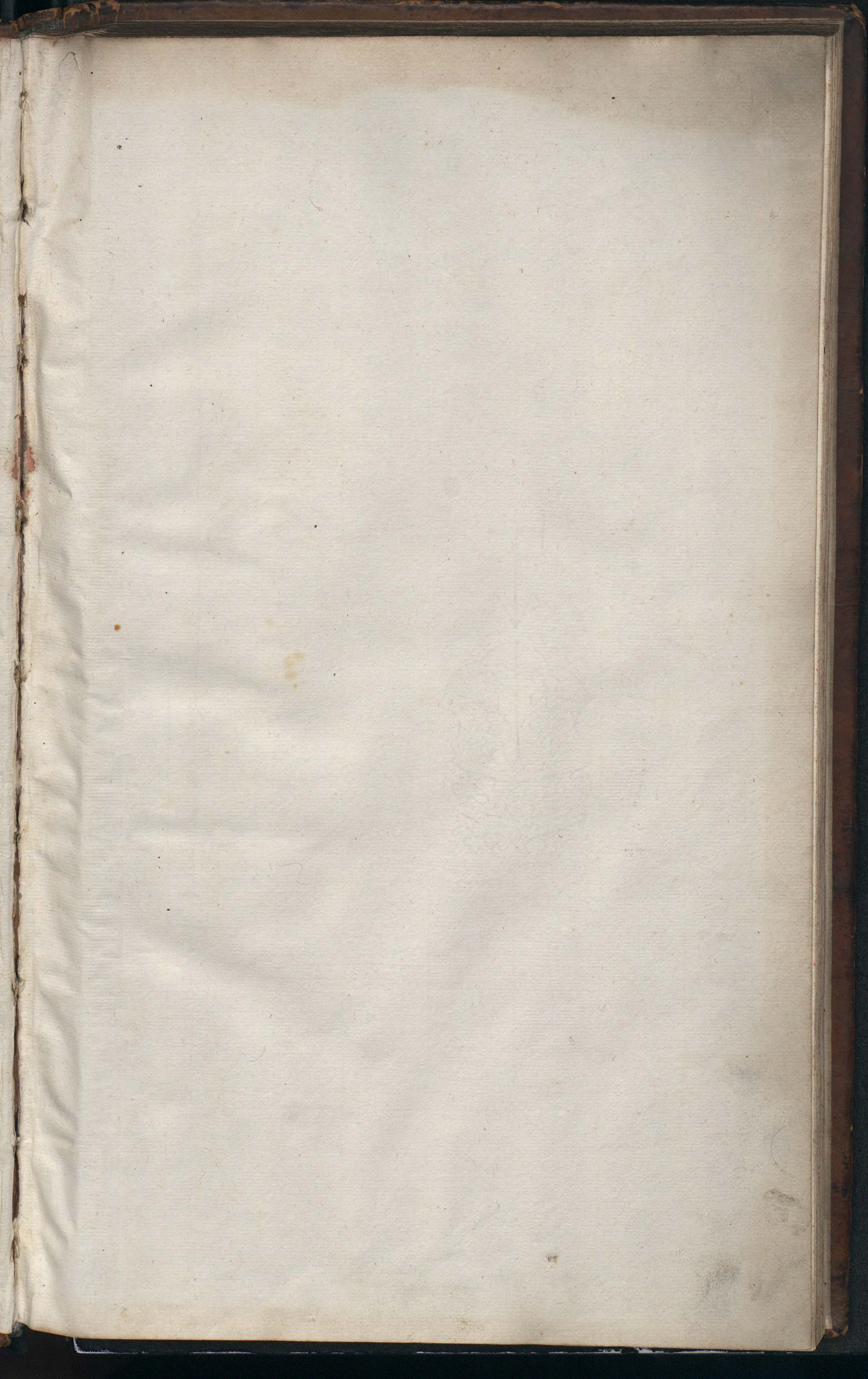
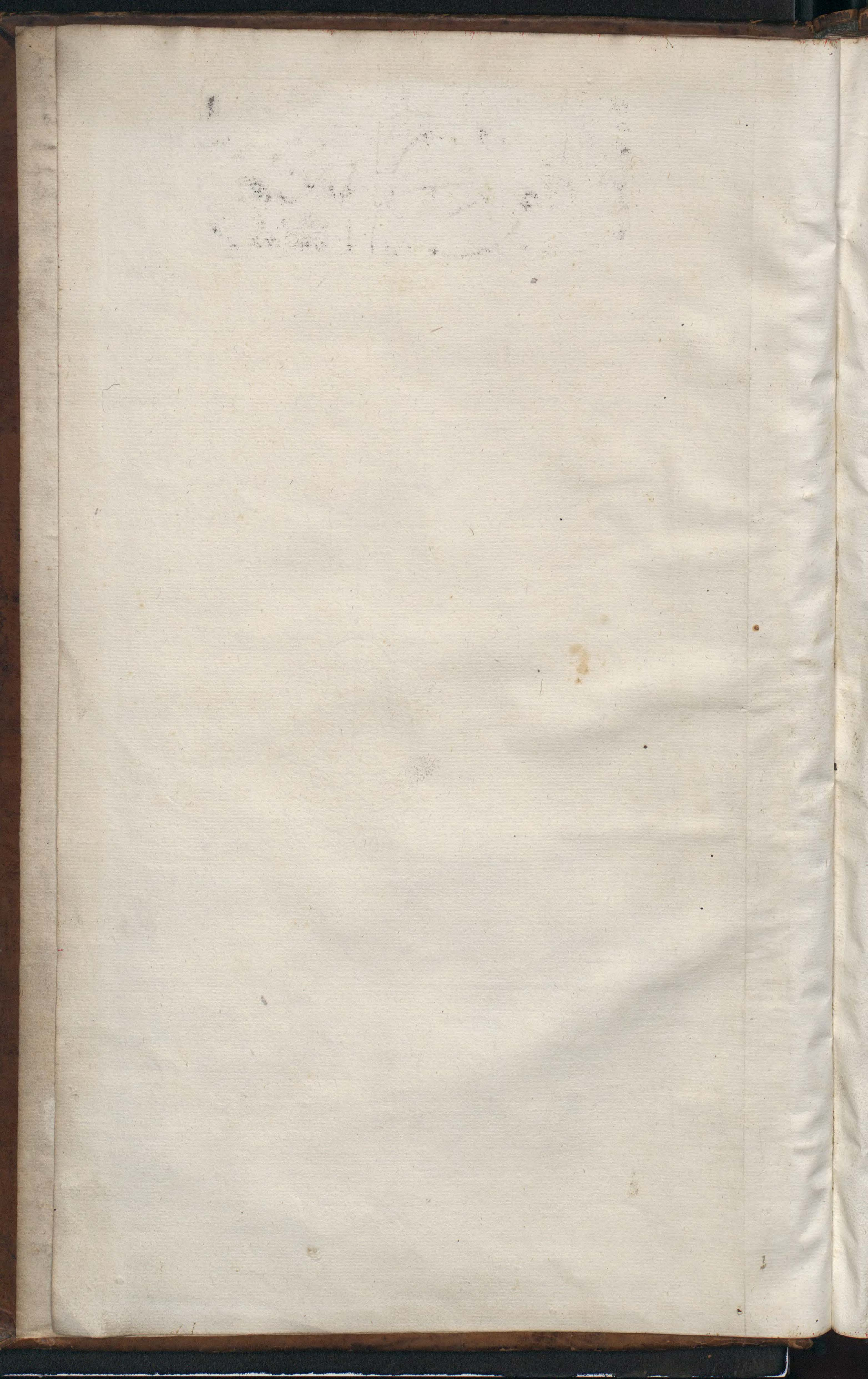


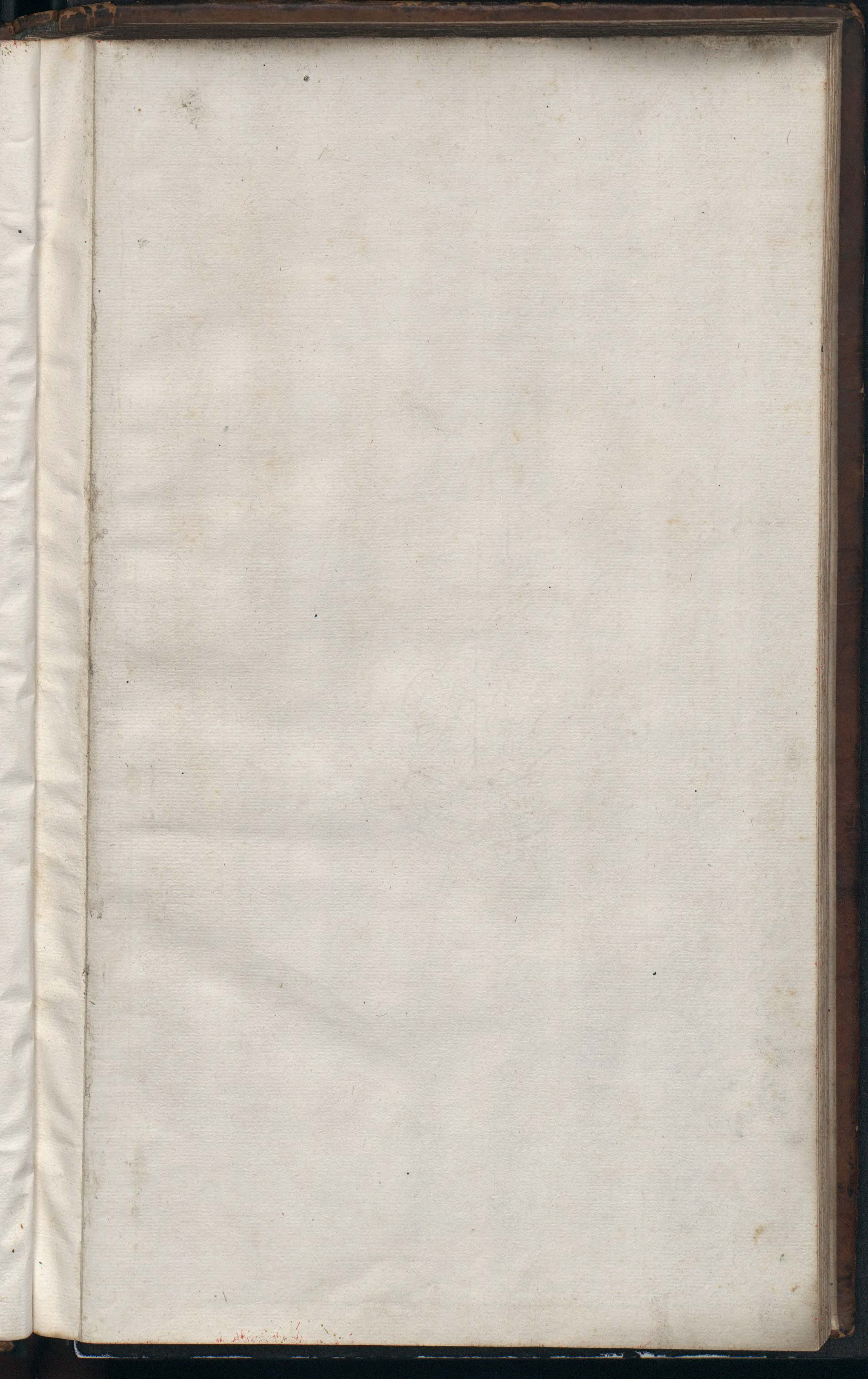






Compendium Astronomiæ Organicæ


Ex
Biblioth. Regia
Berolinensi.



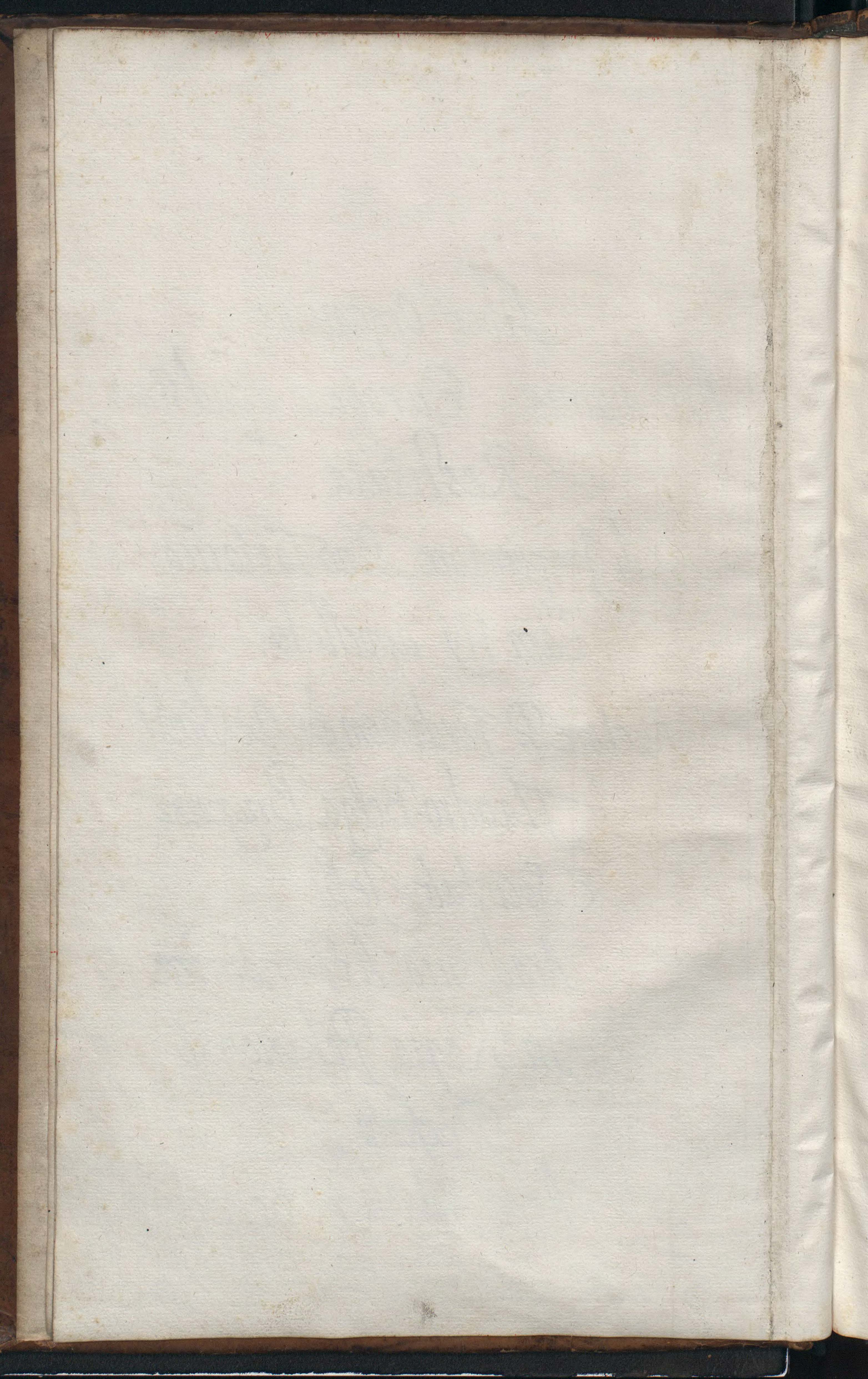


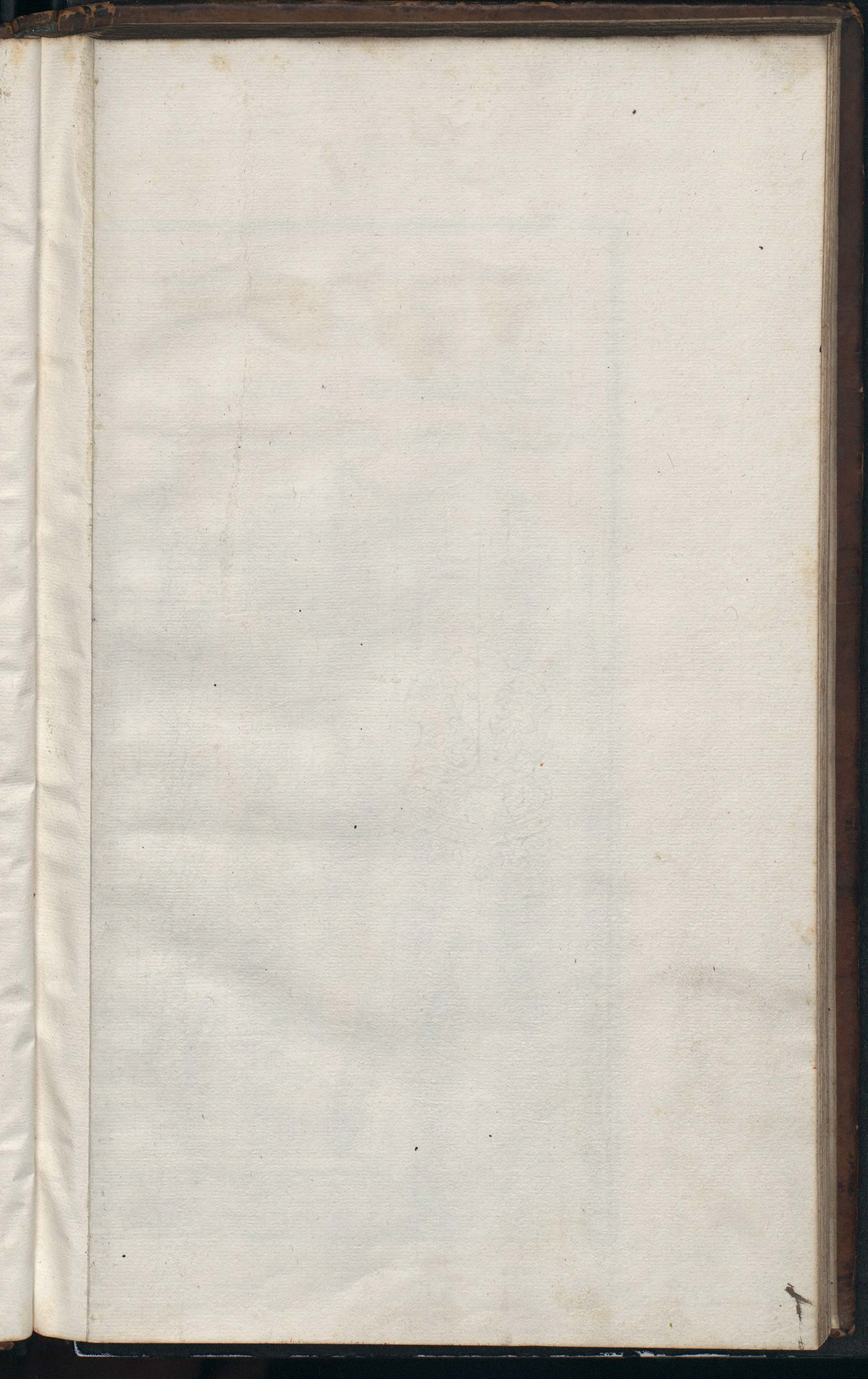
Liber Organicus
Astronomiæ Europææ apud Sinas Restitutæ

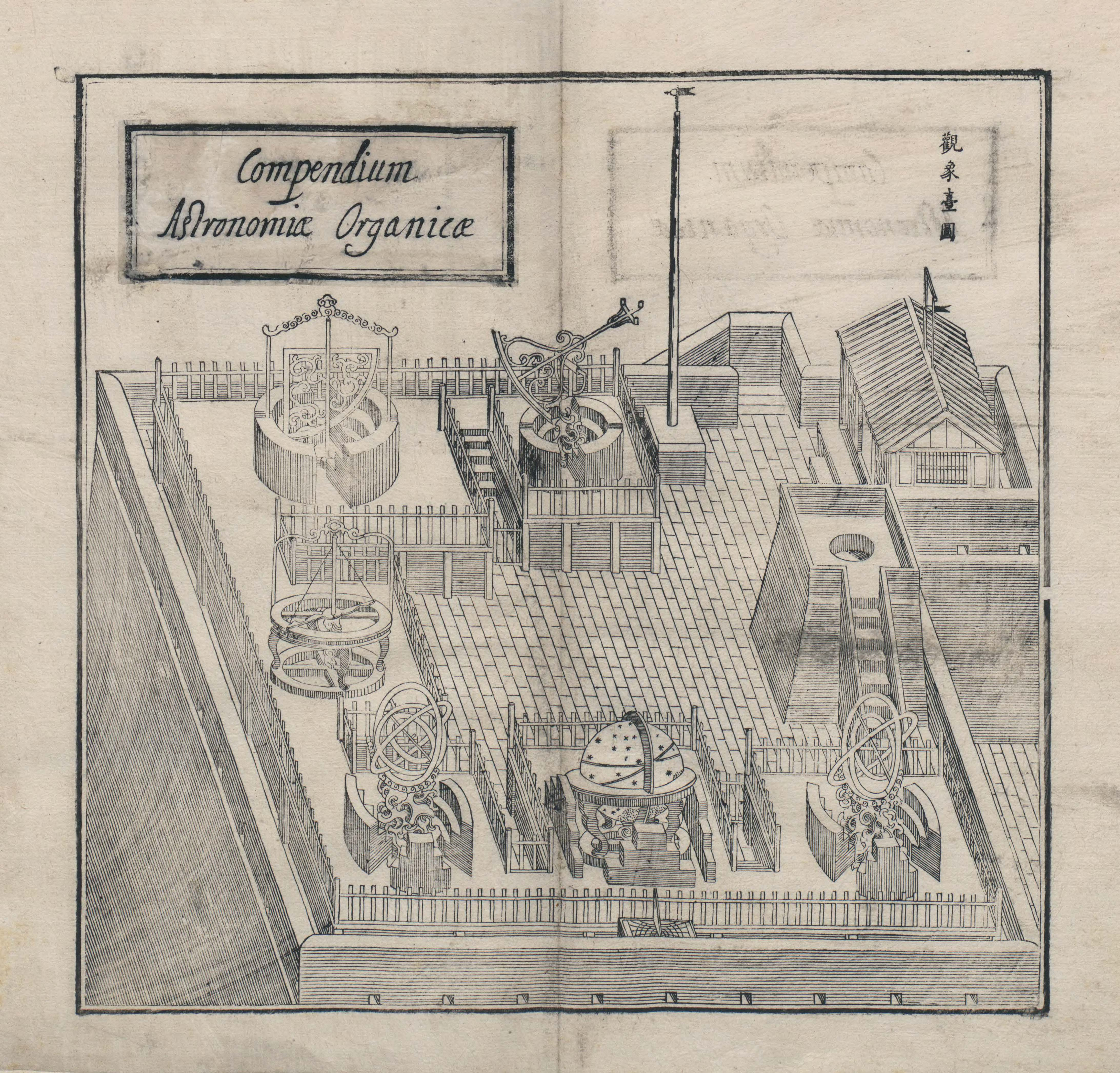
Sub Imperatore Sino-Tartarico
Cām Hȳ appellato

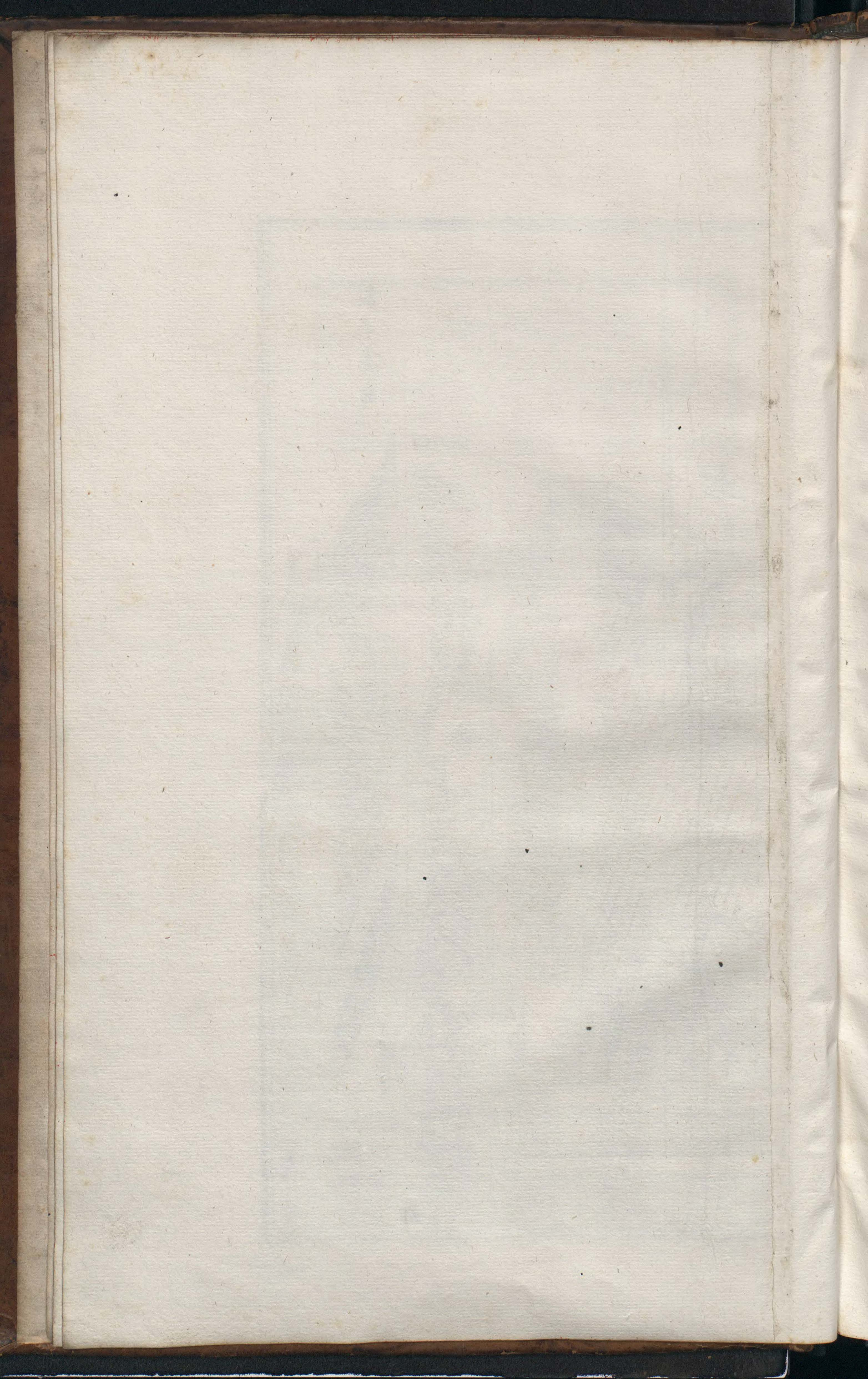
Auctore P. Ferdinando Verbiest
Flandro-Belga Brugensi
E Societate Jesu
Academiæ Astronomicæ
In Regia Pekinensi
Præfecto

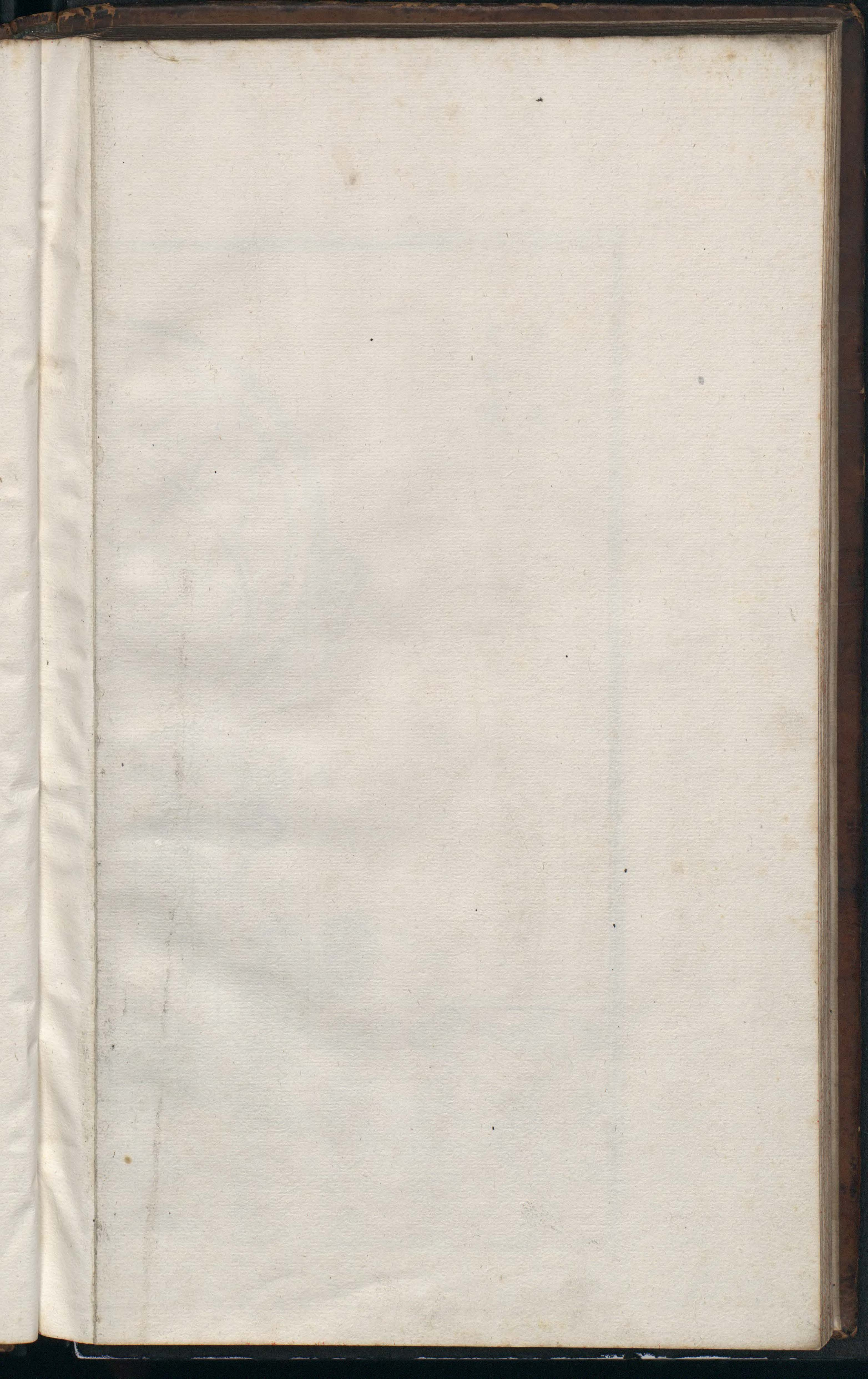
Anno Salutis M.DC.LXVIII

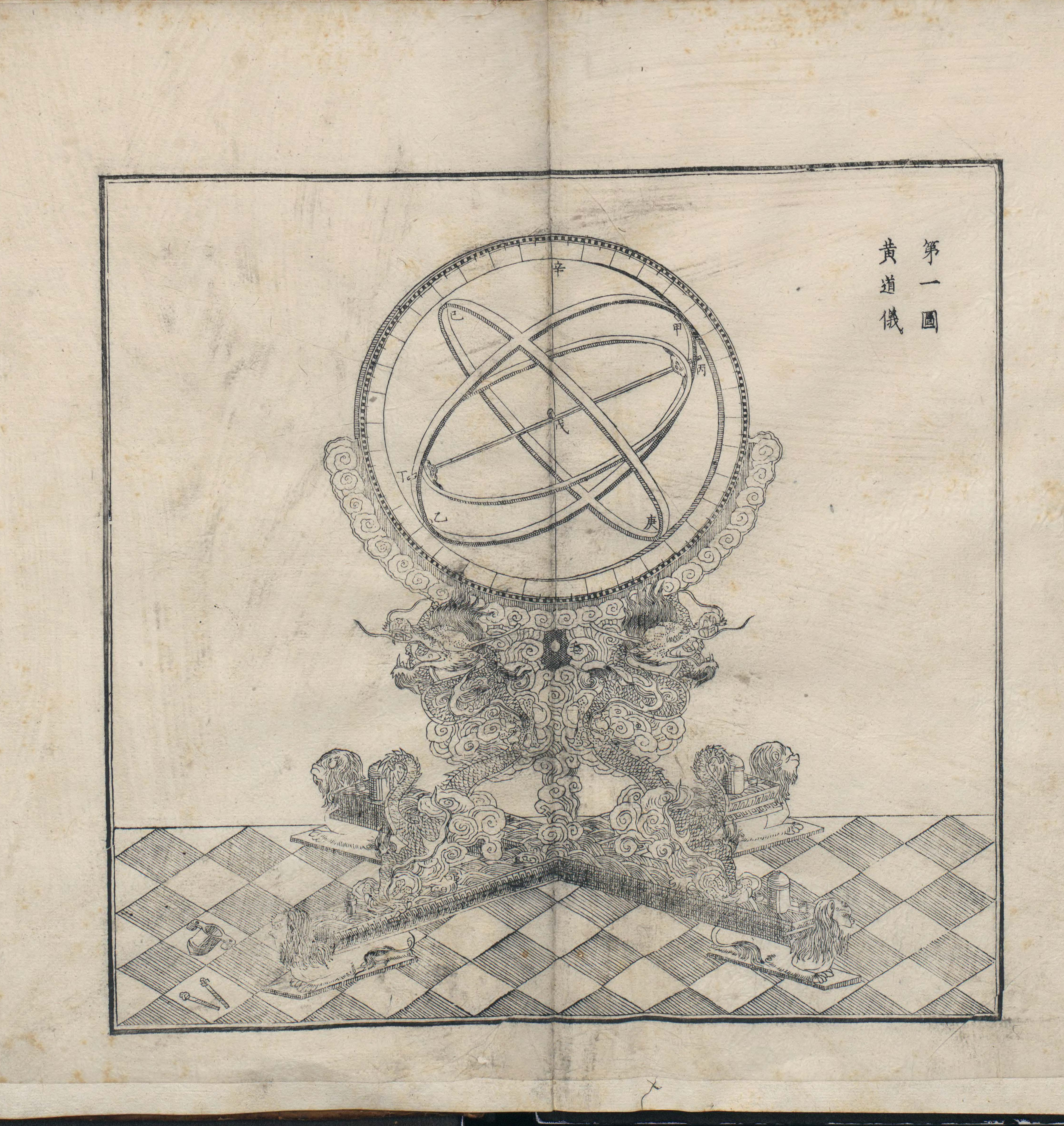




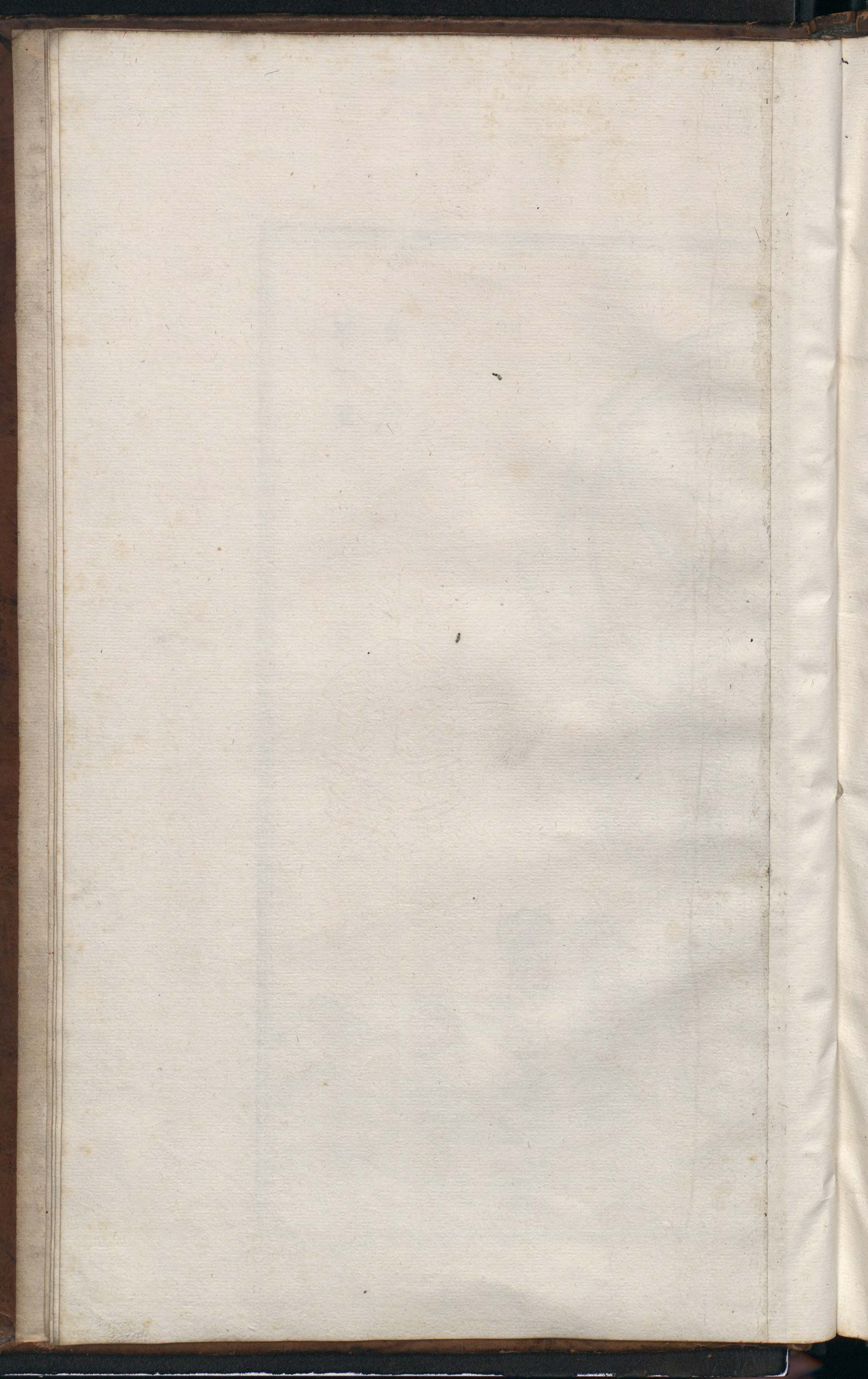

Compendium
Astronomiæ Organicæ
觀象臺圖

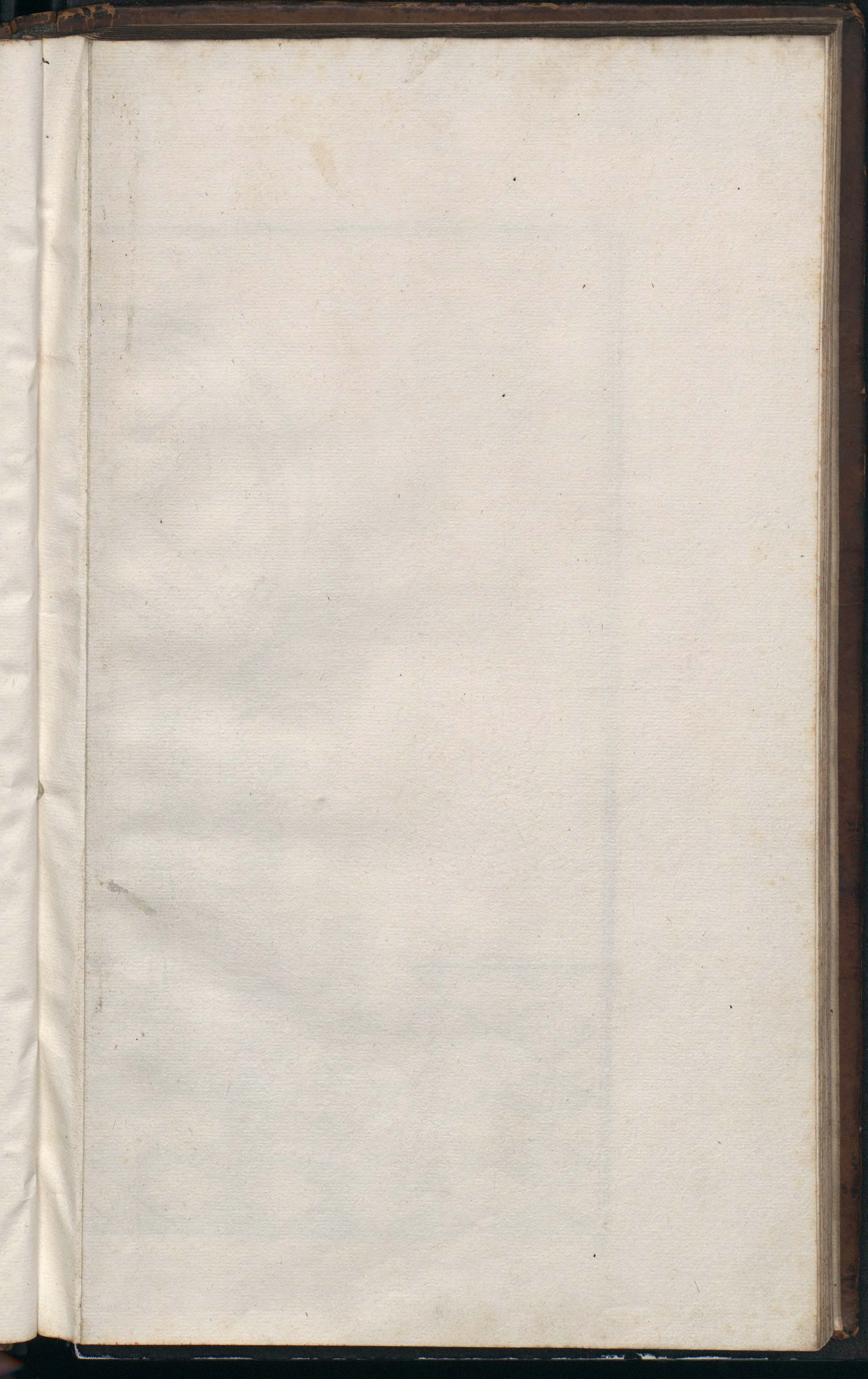


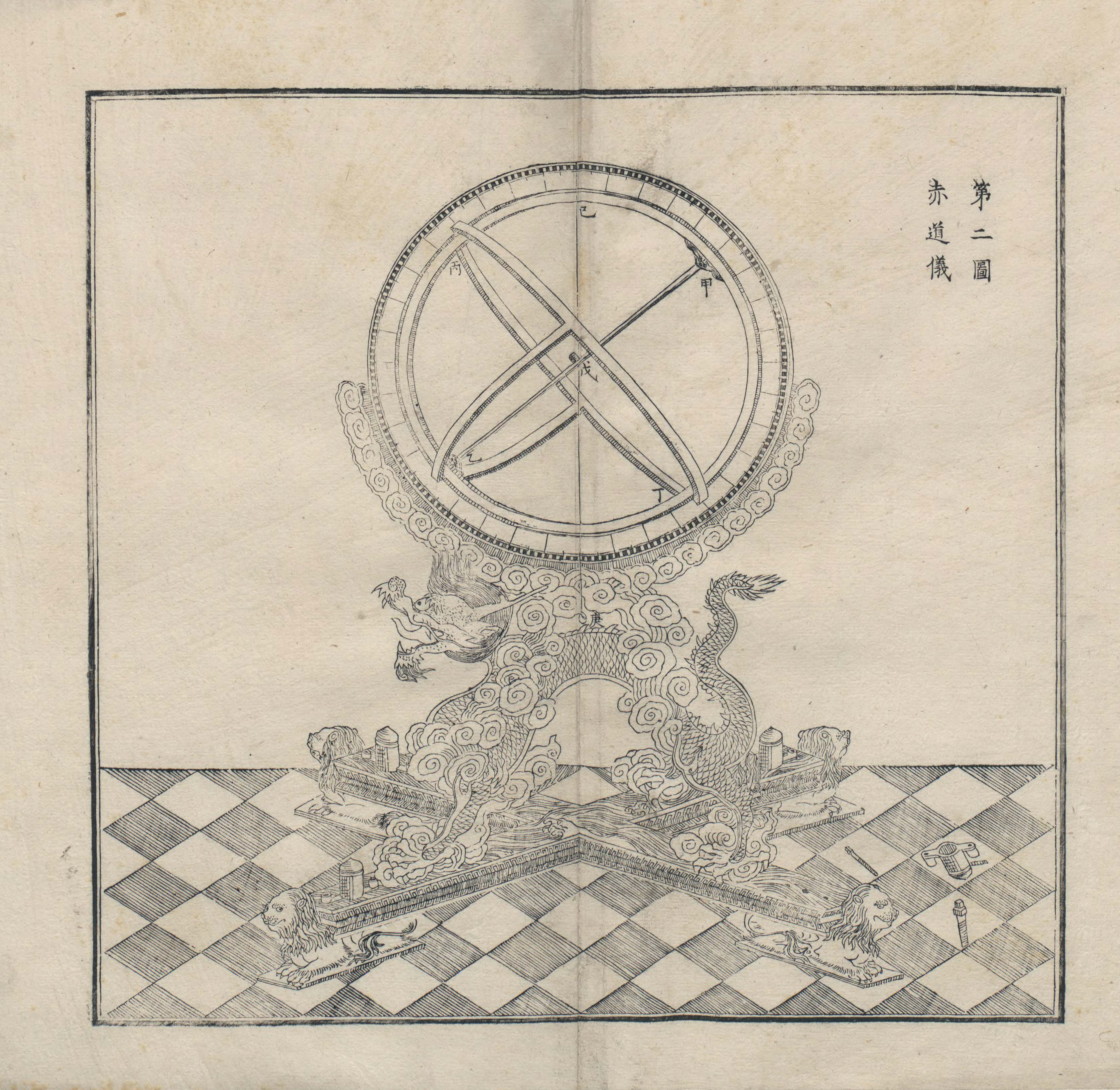




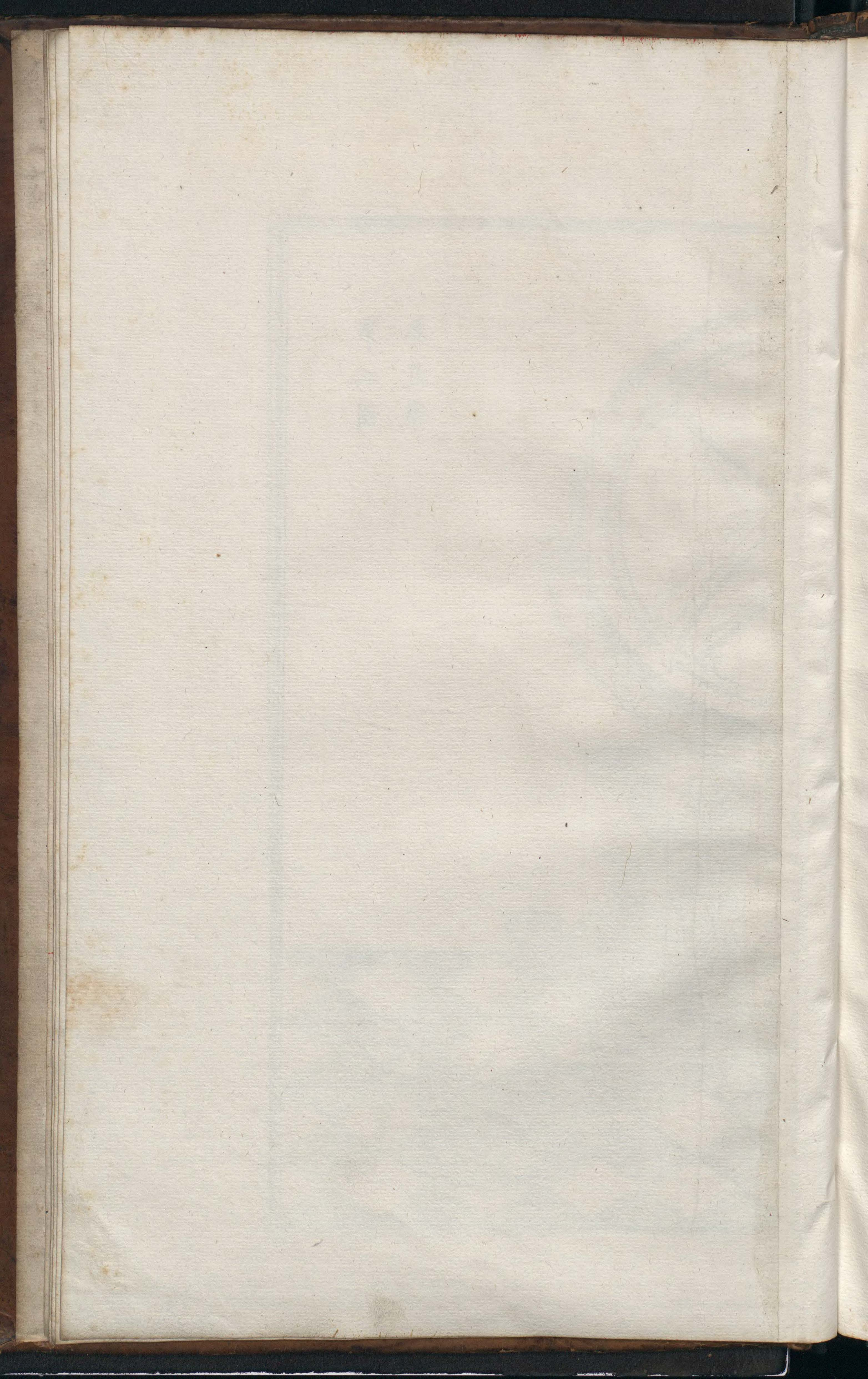
第一圖
黃道儀

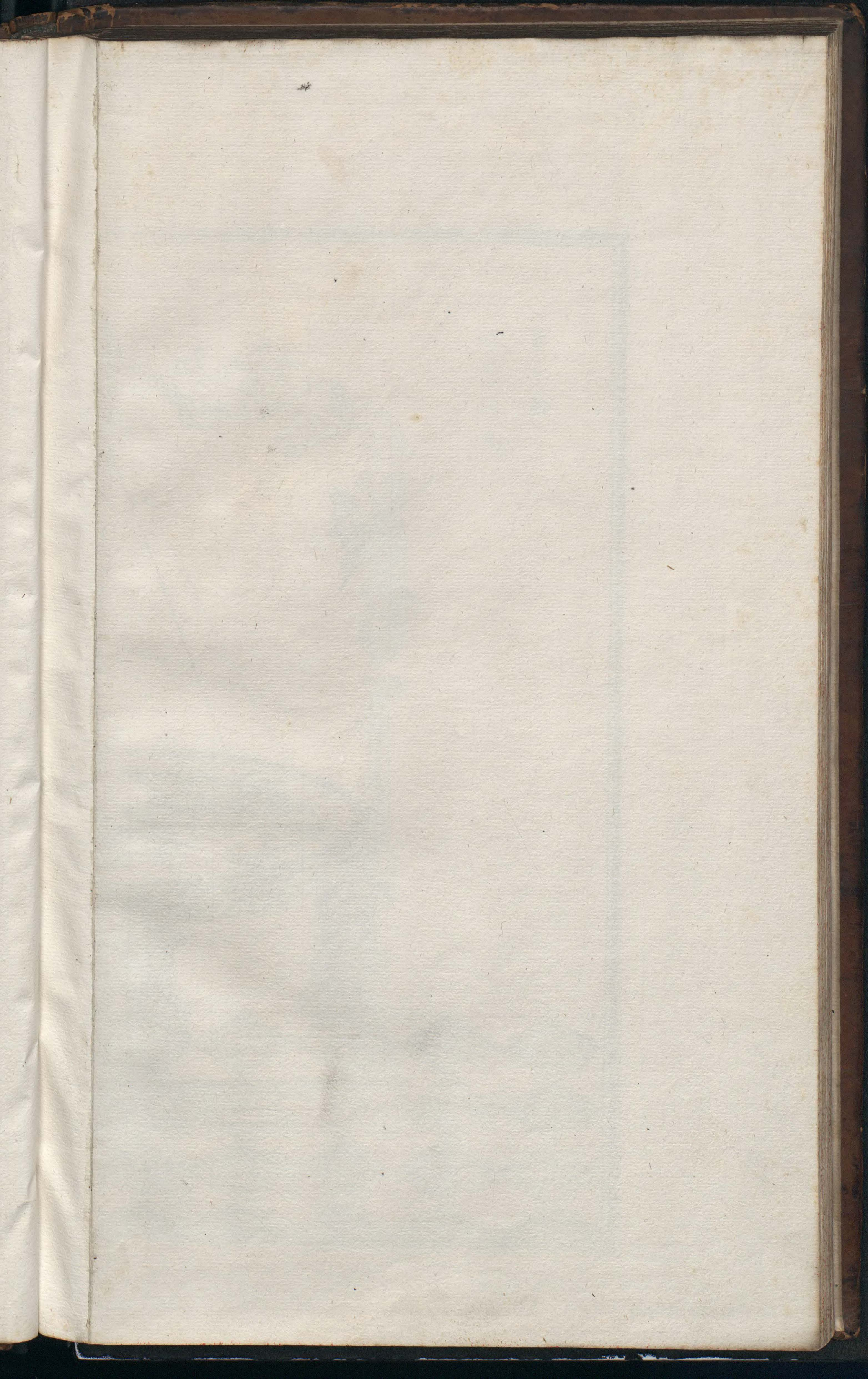


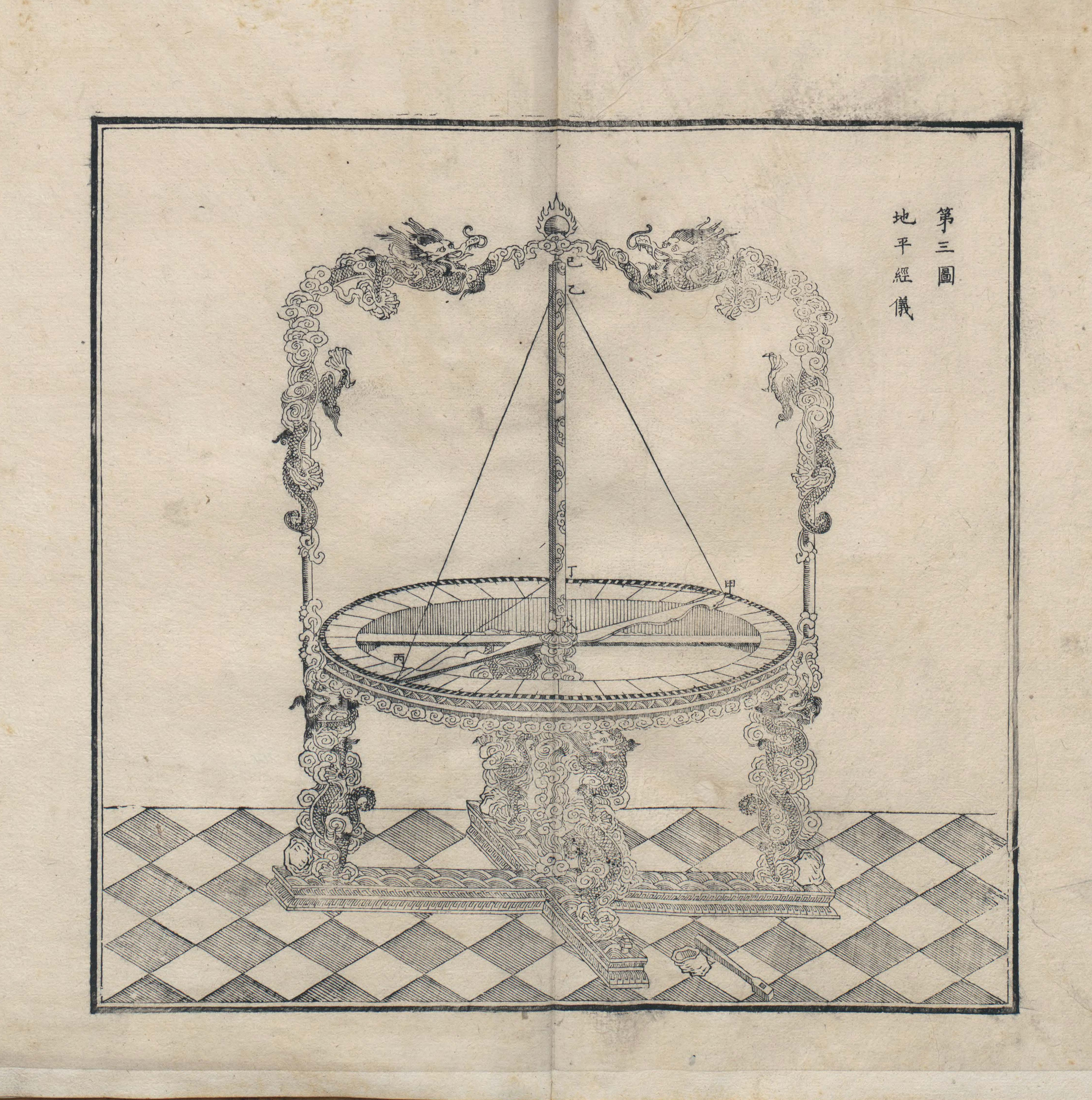




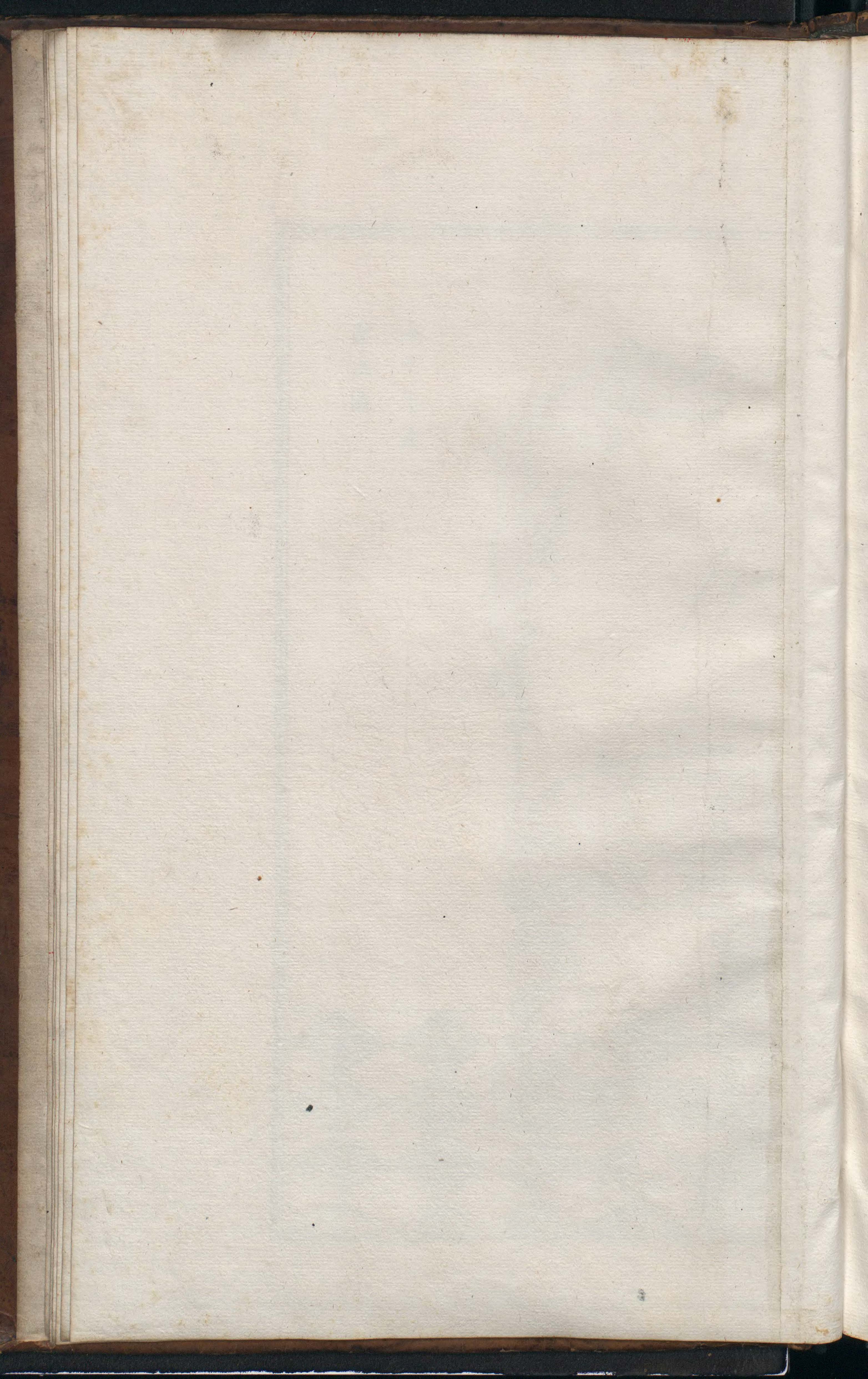
第二圖
赤道儀

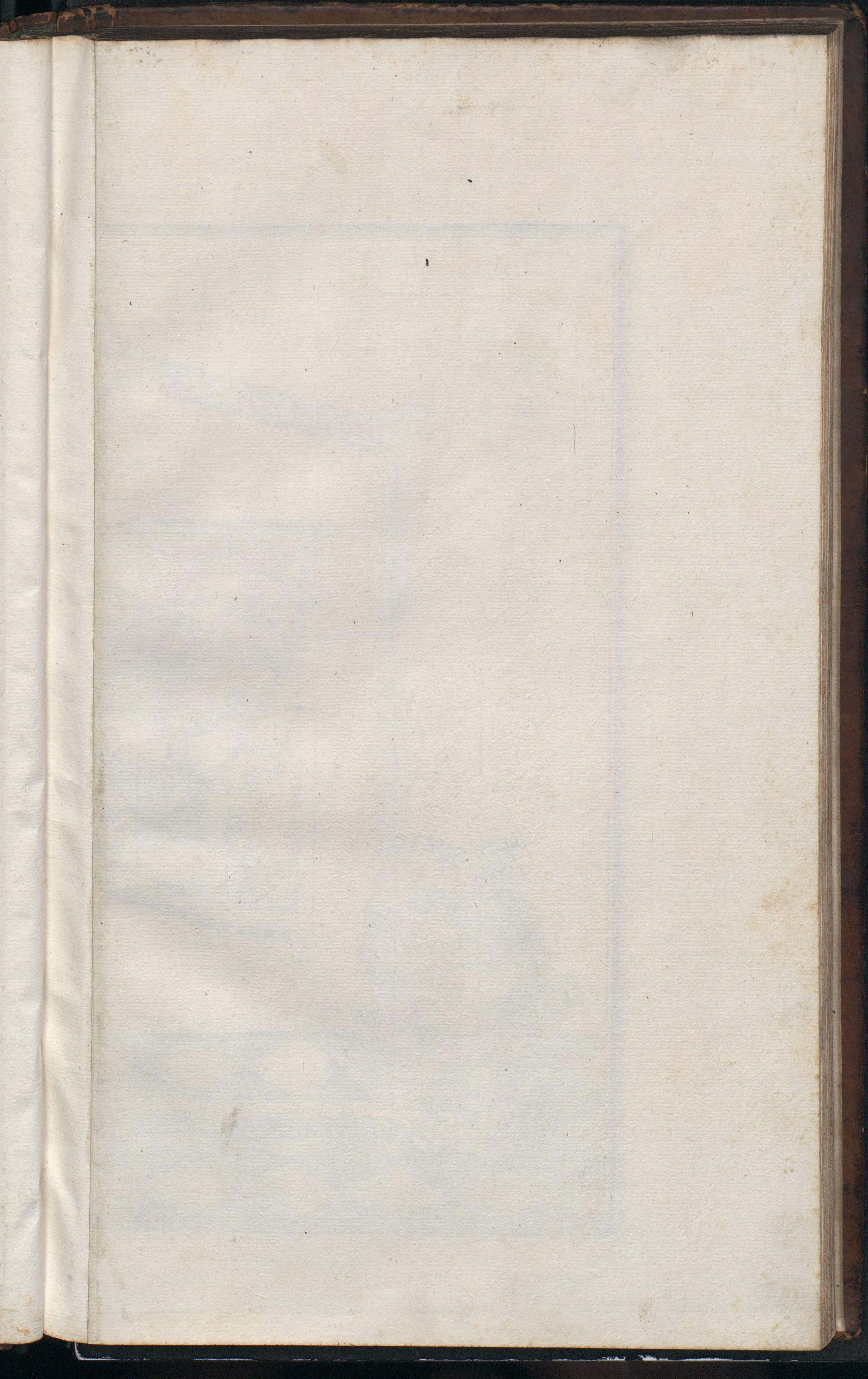


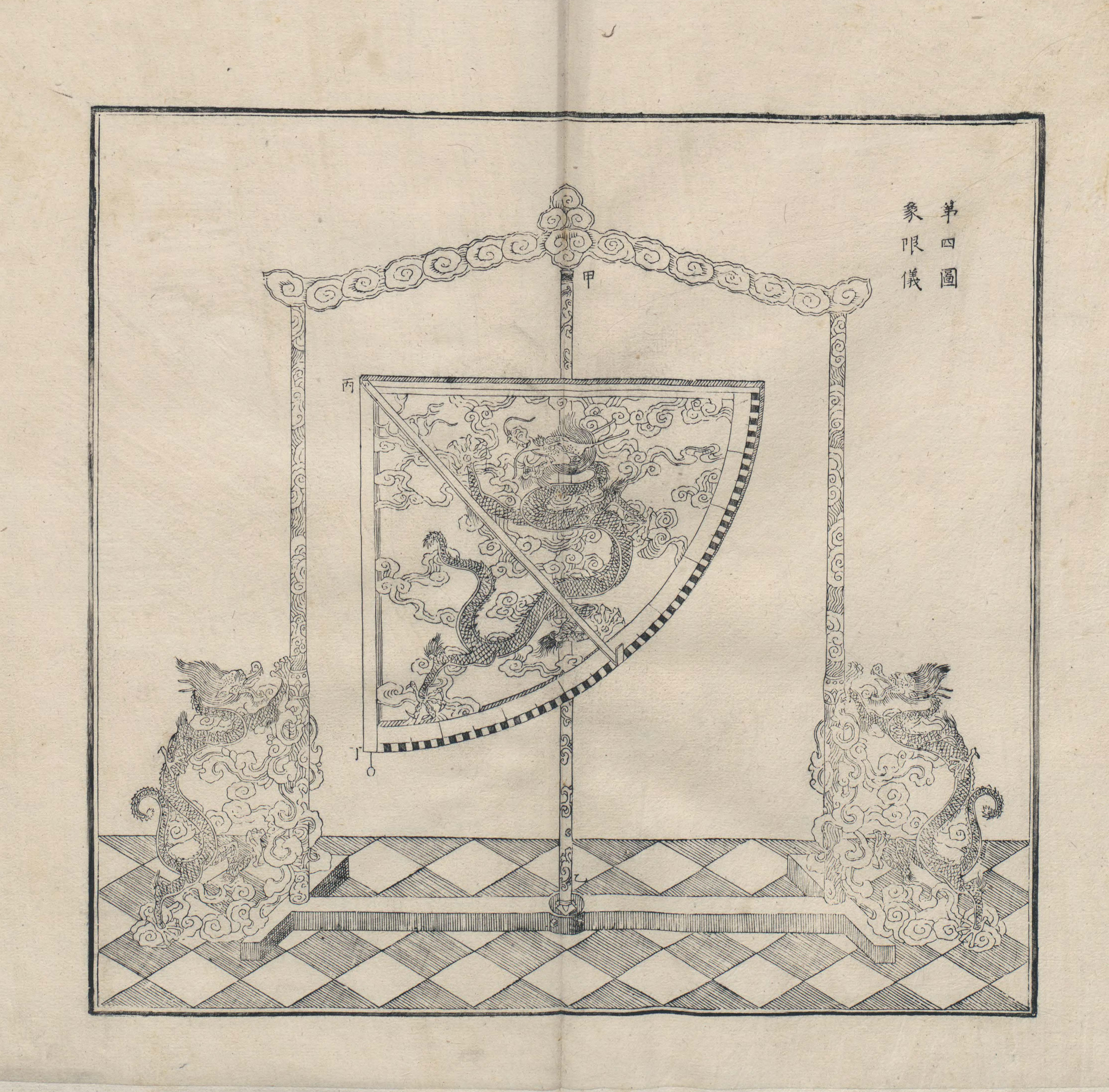




第三圖
地平經儀

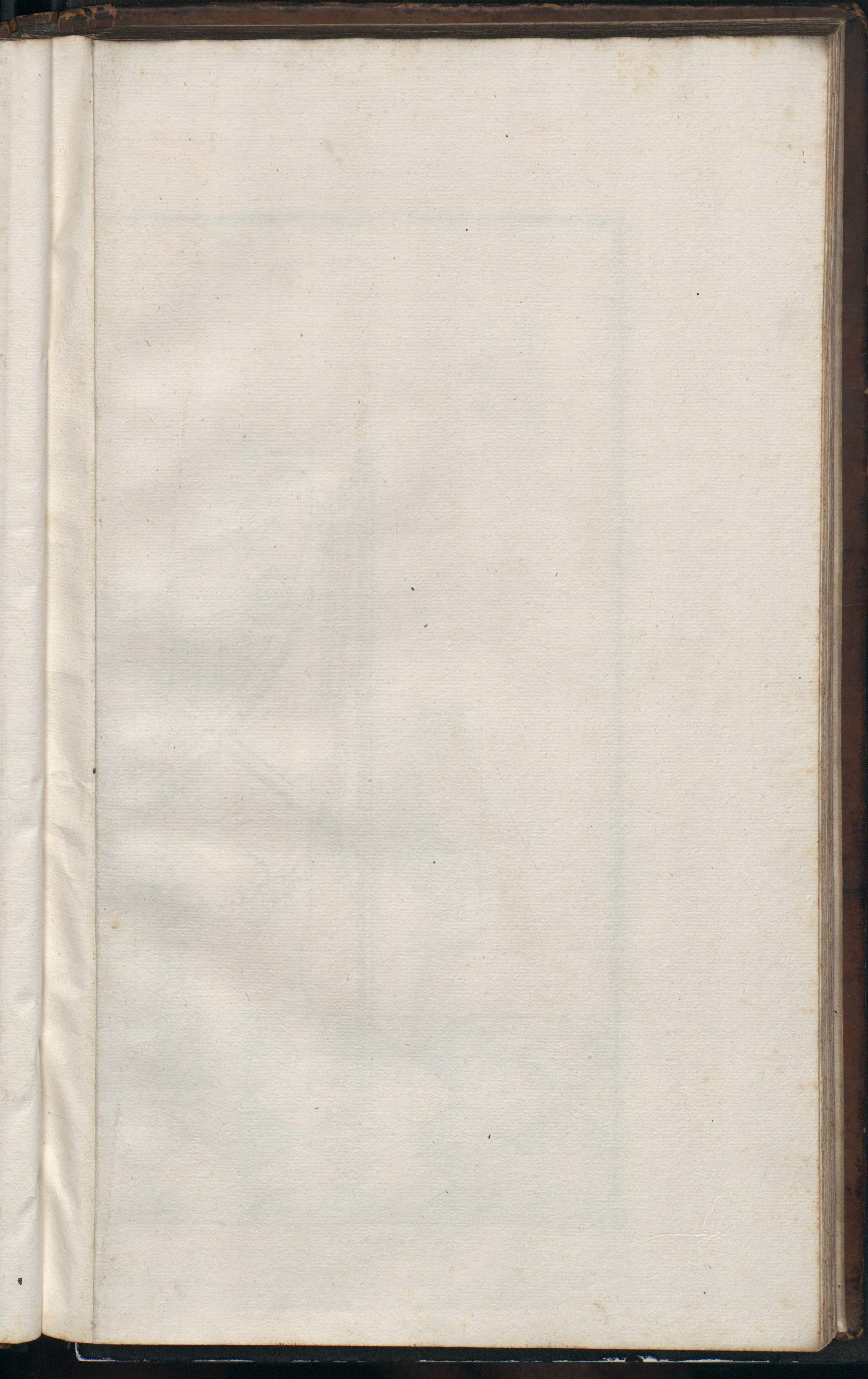


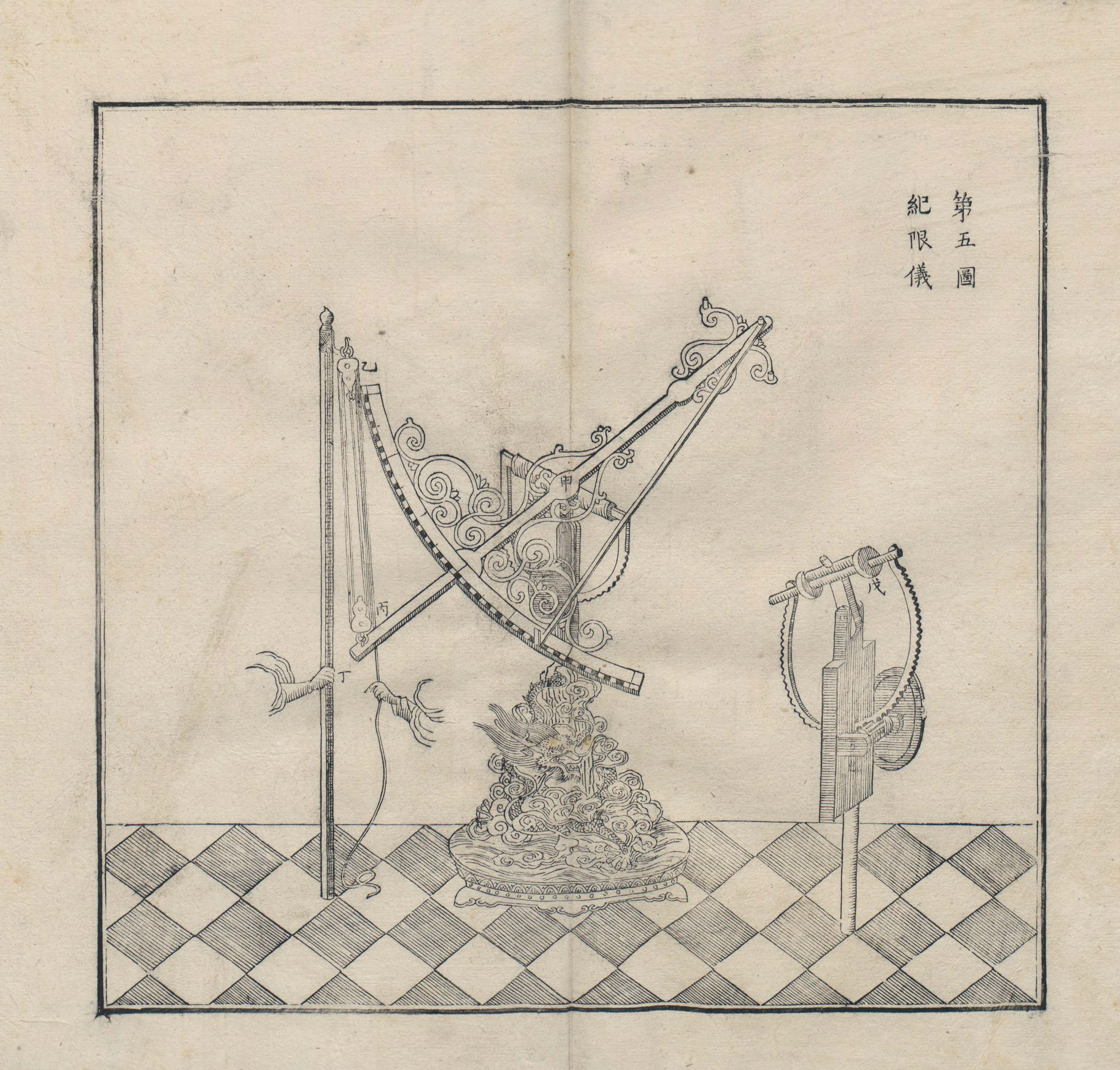




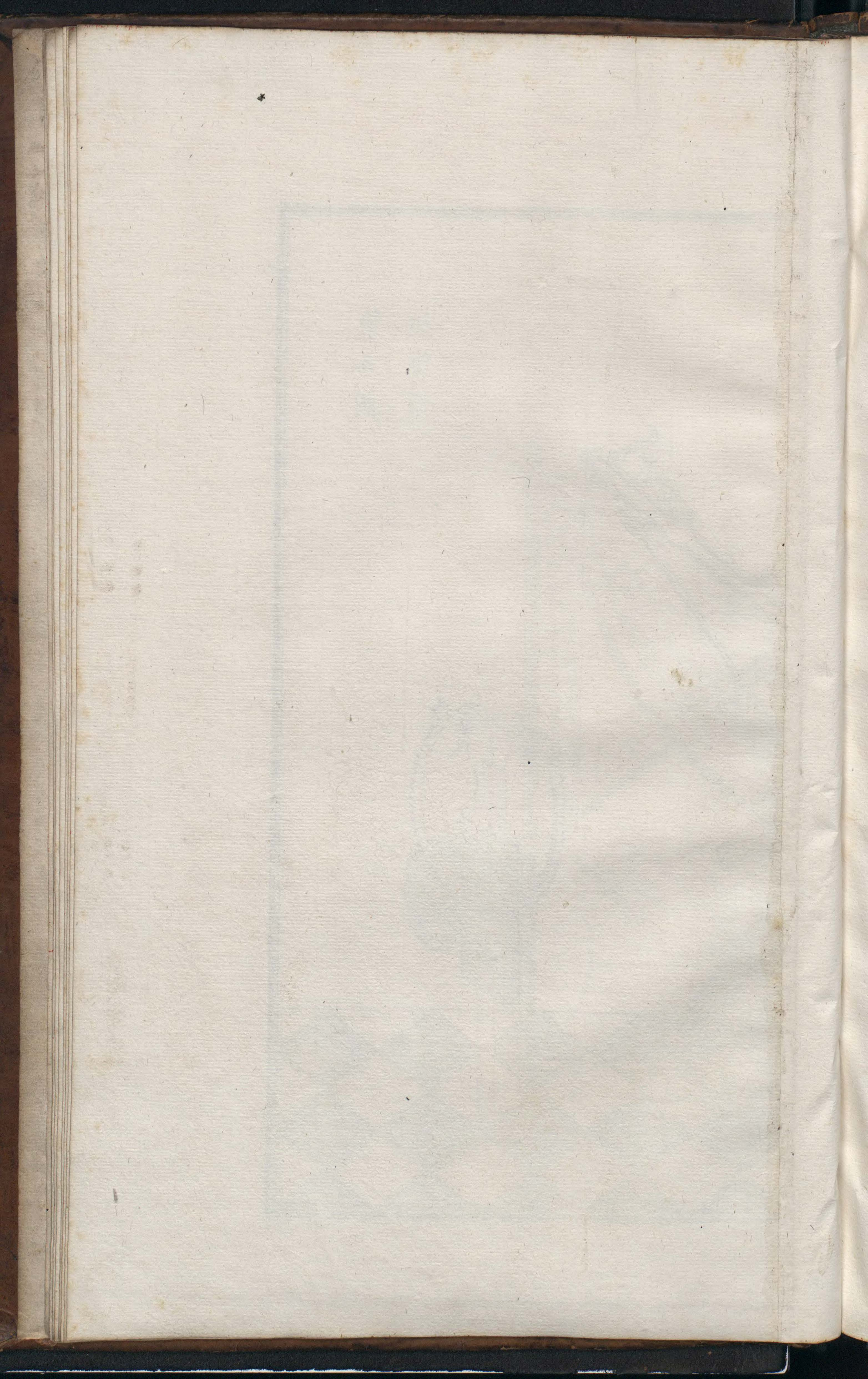
第四圖 象限儀

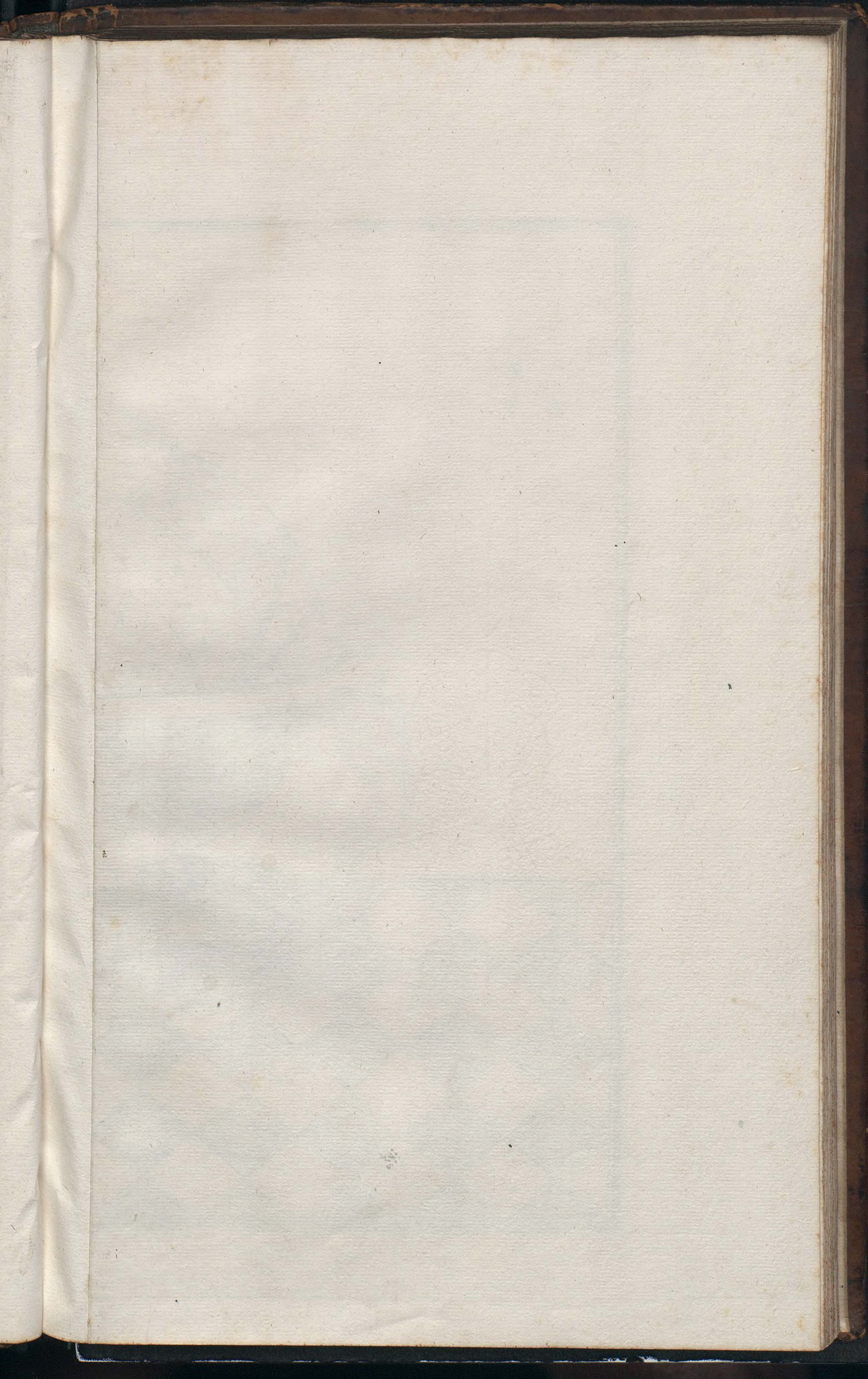


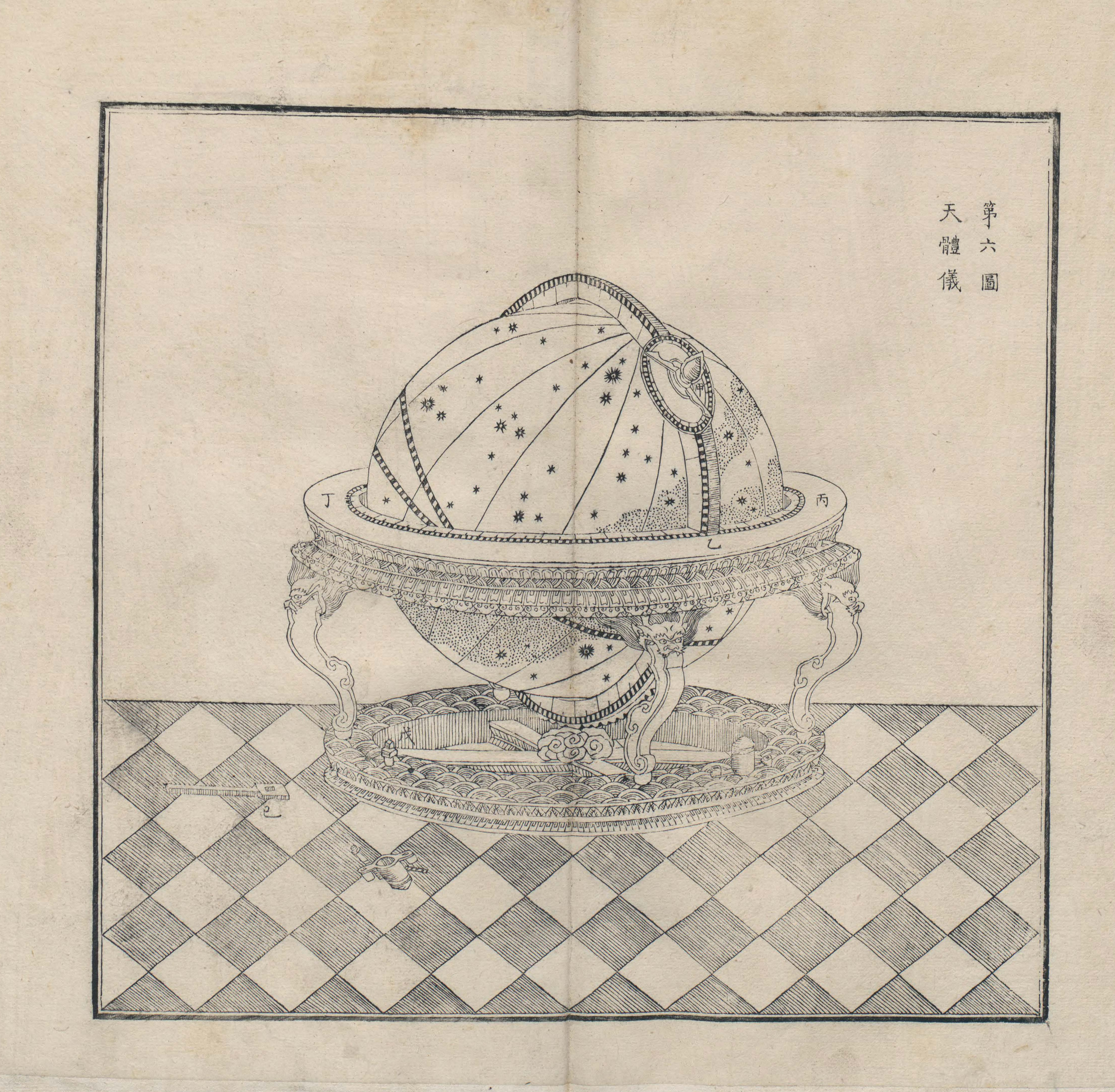




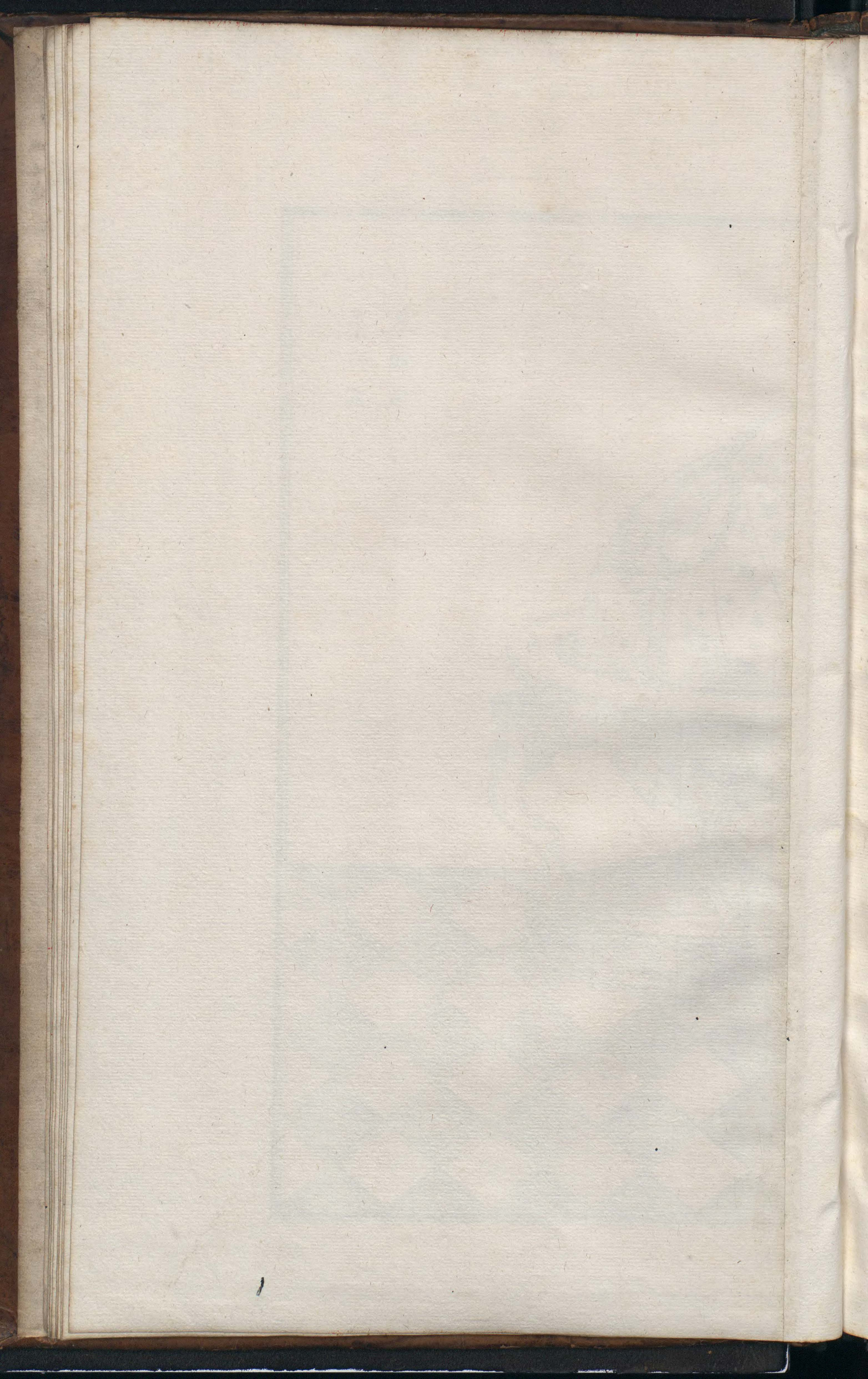
第五圖
紀限儀

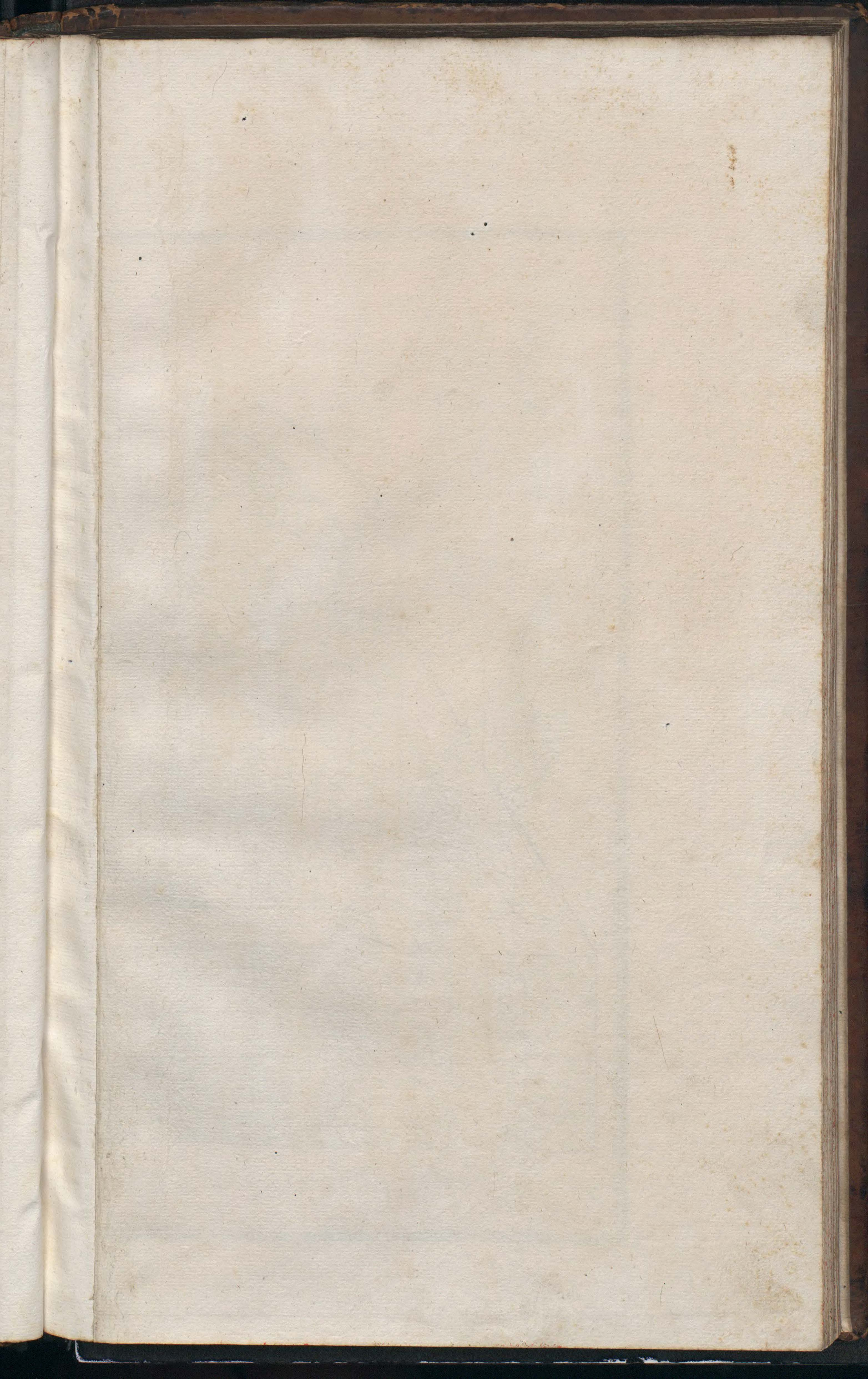


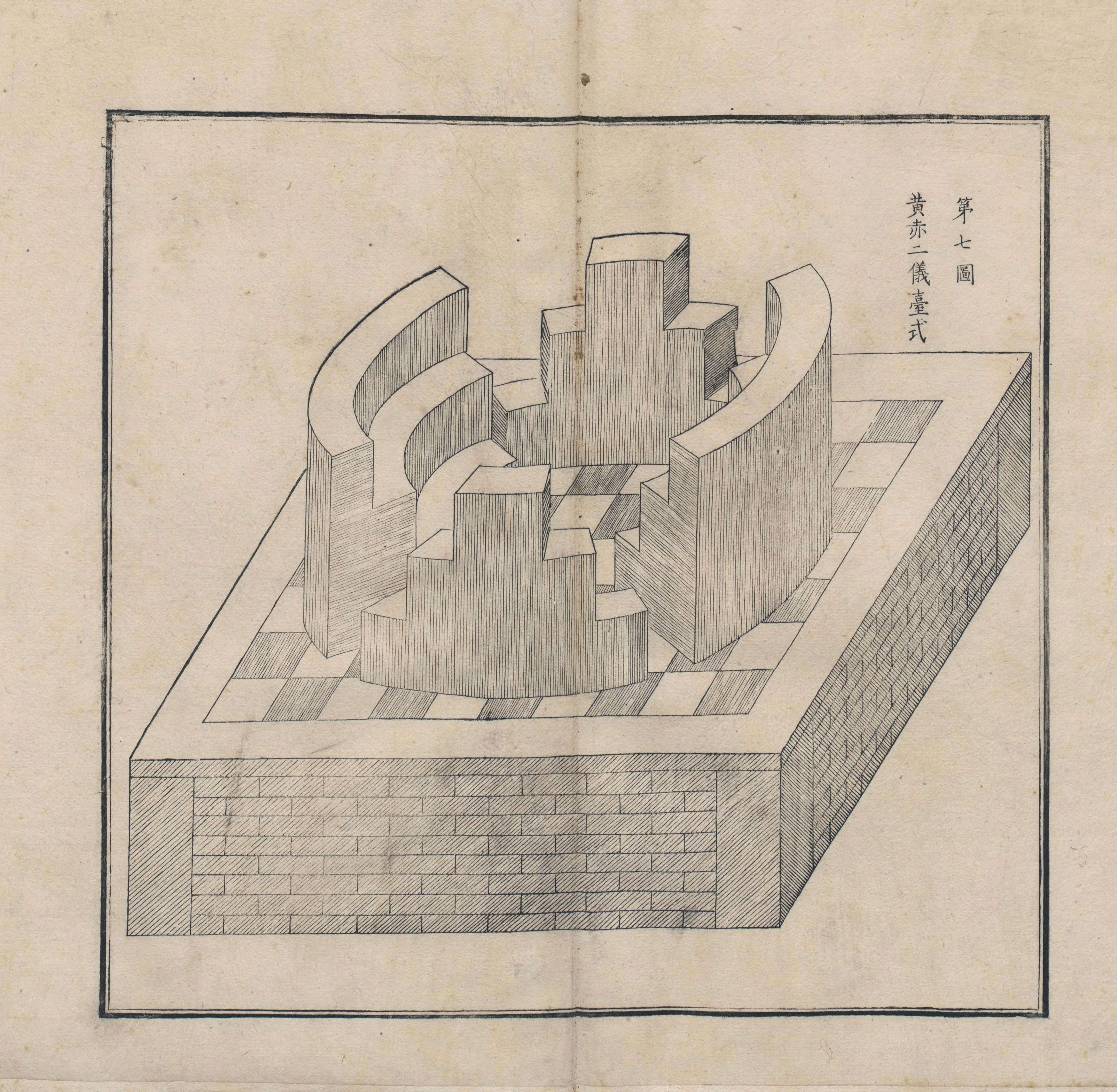




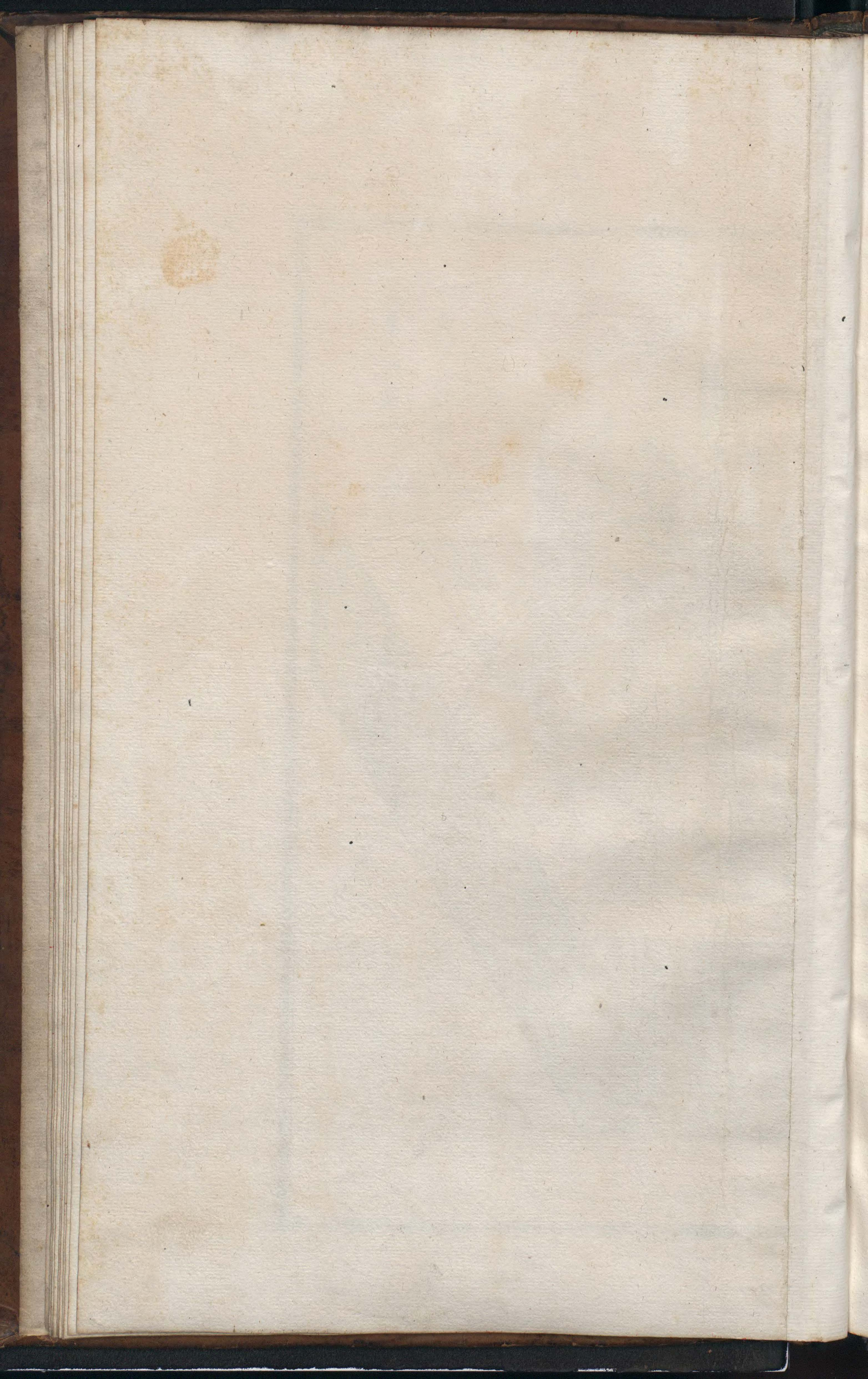
第六圖 天體儀

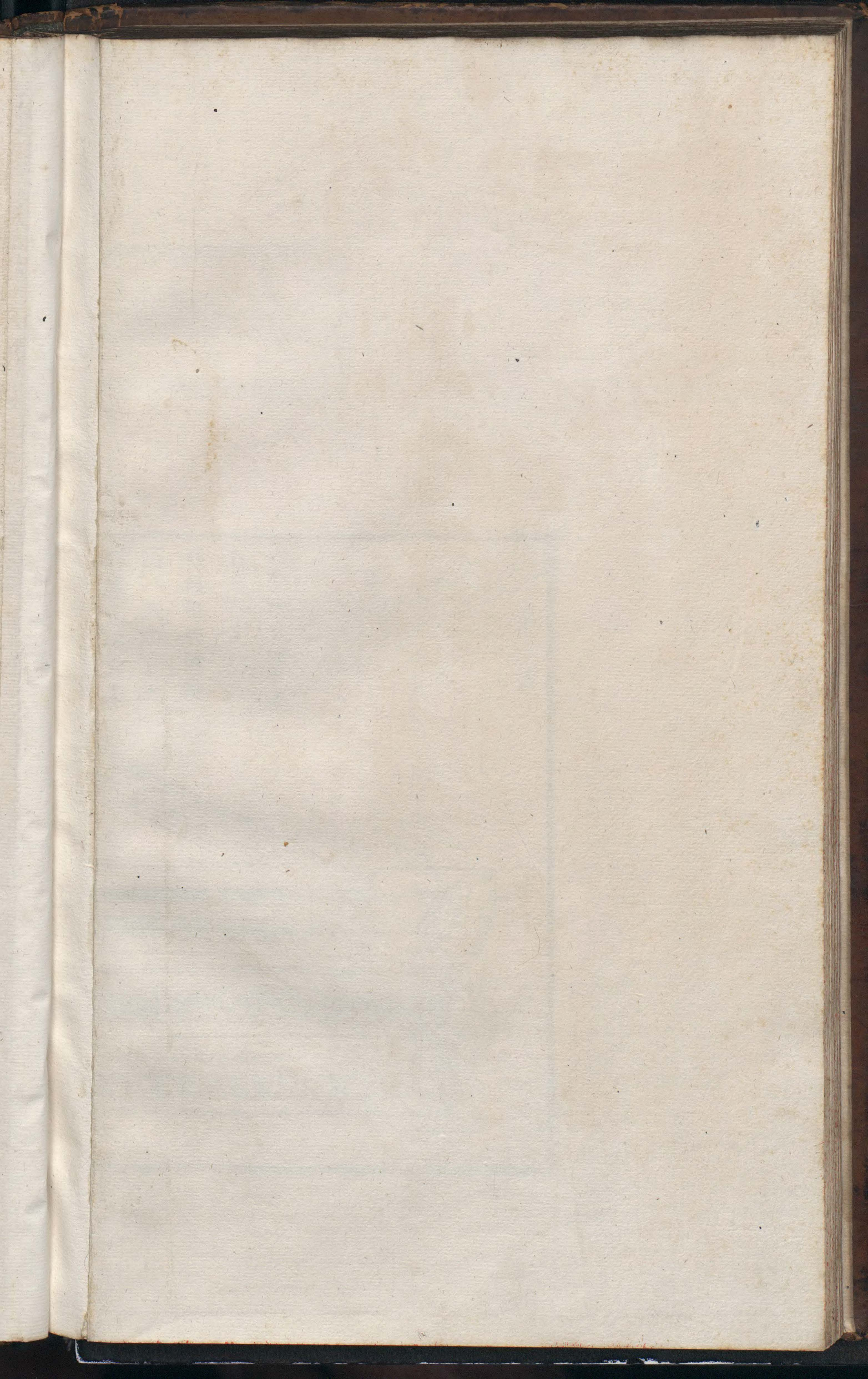




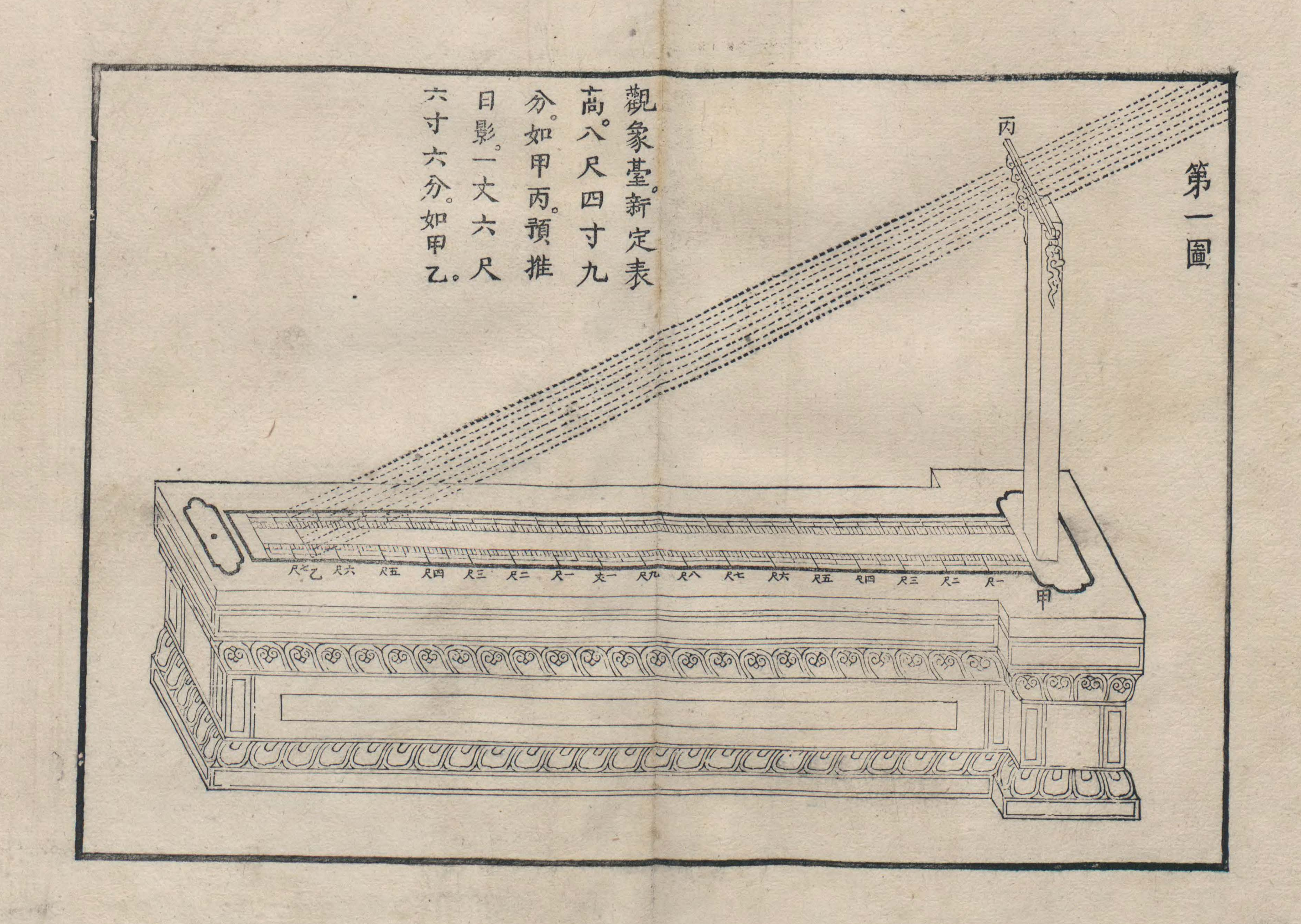


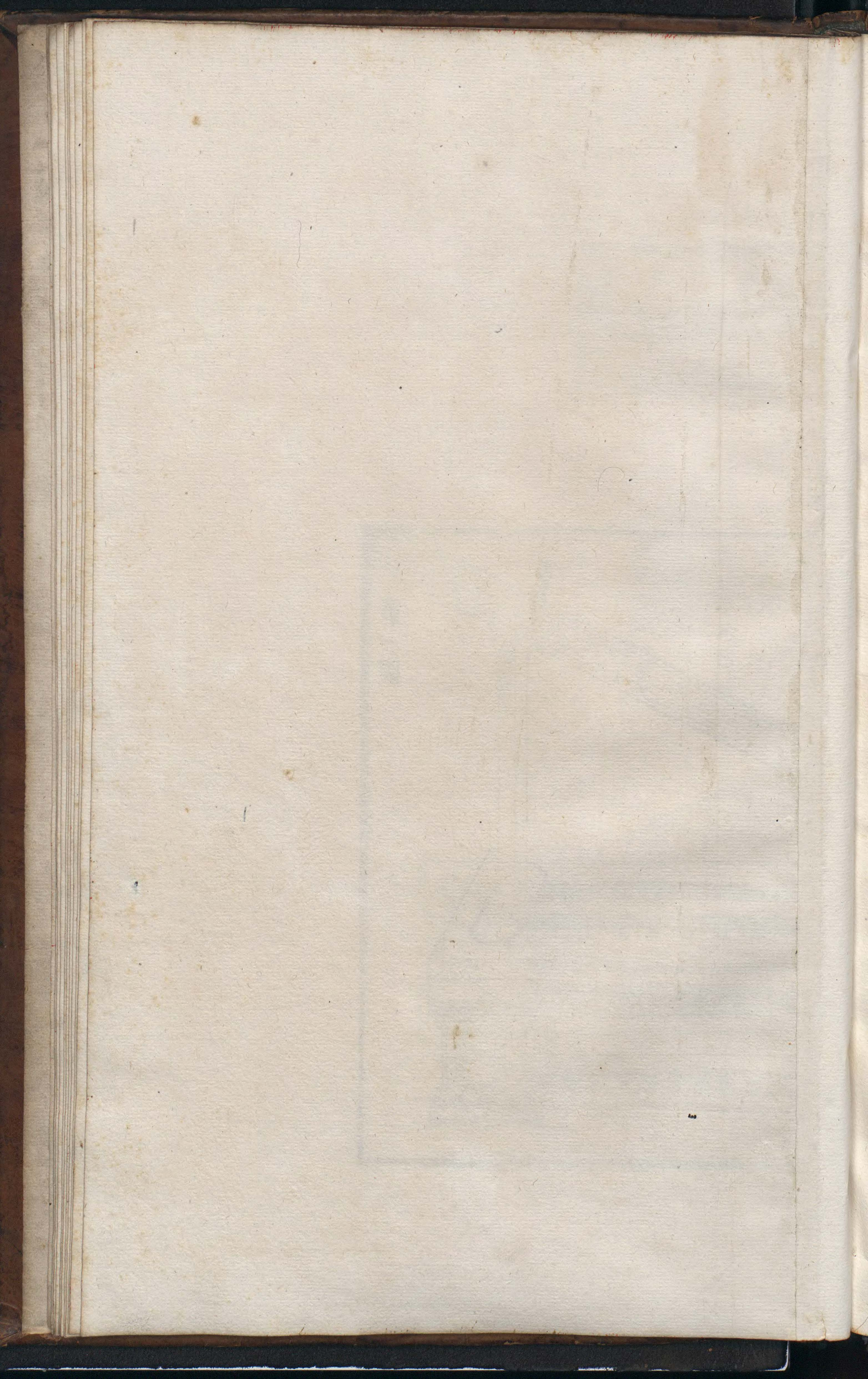
第七圖
黃赤二儀臺式

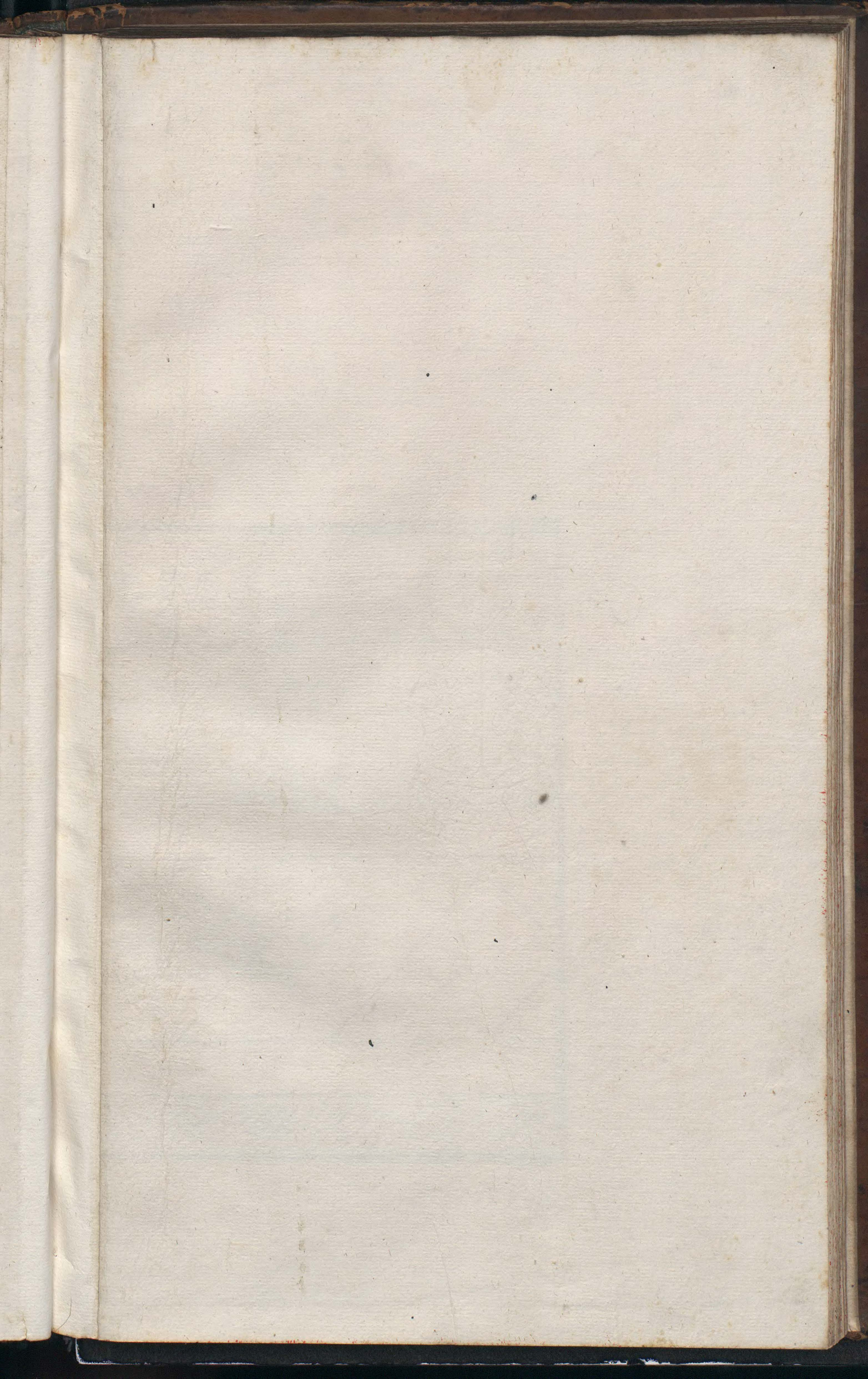




obseruationes Astronomicae



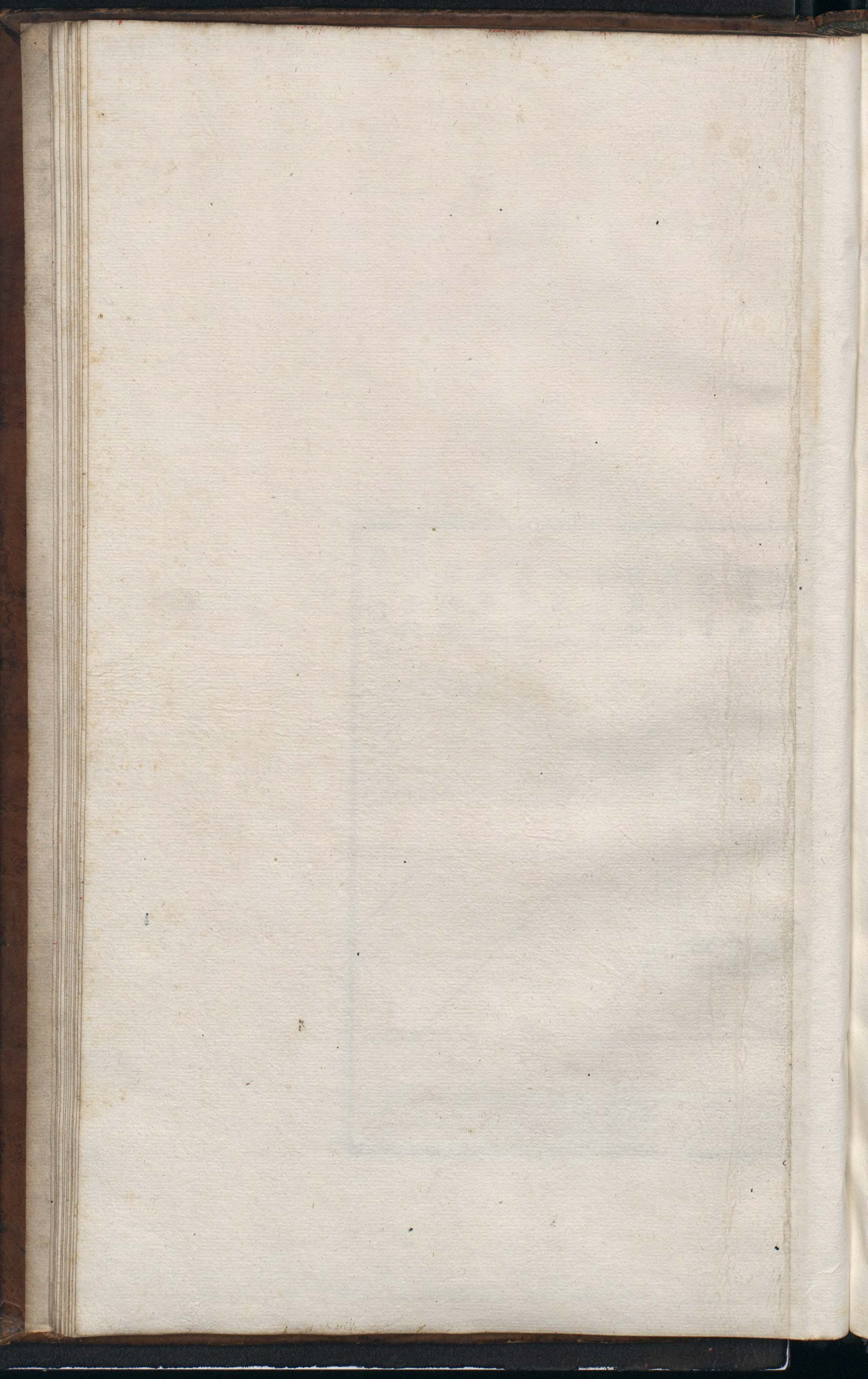


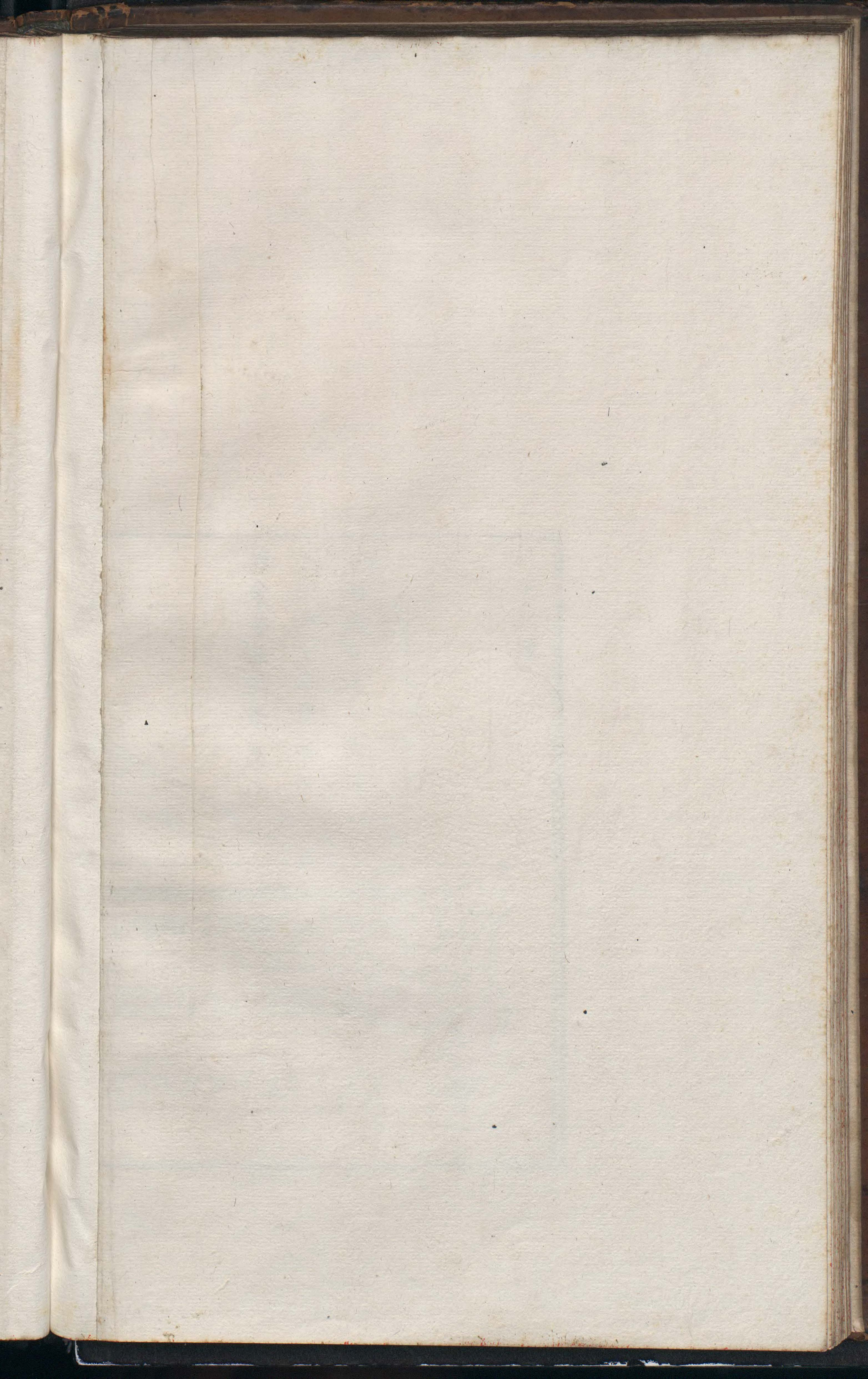


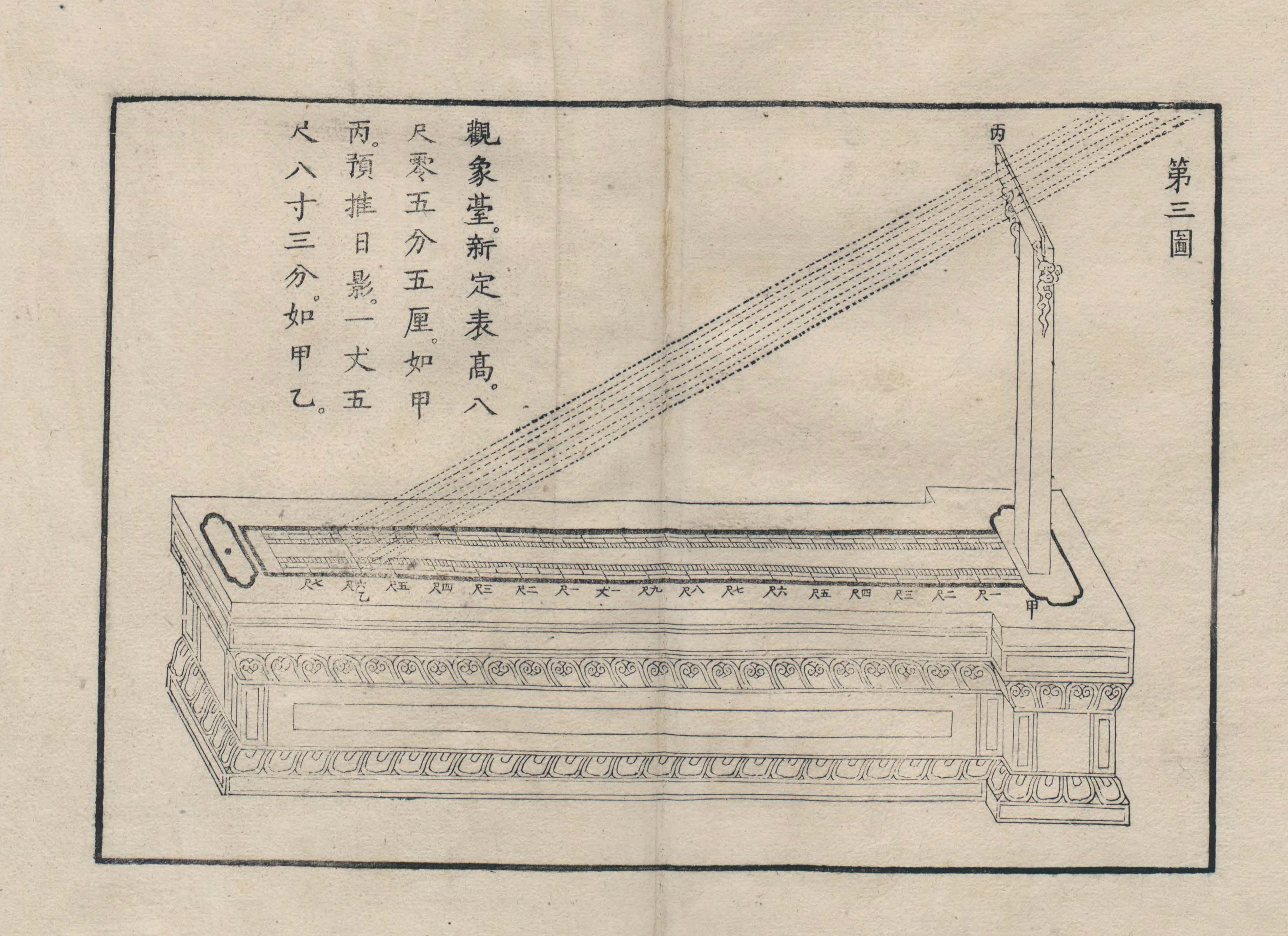
第二圖

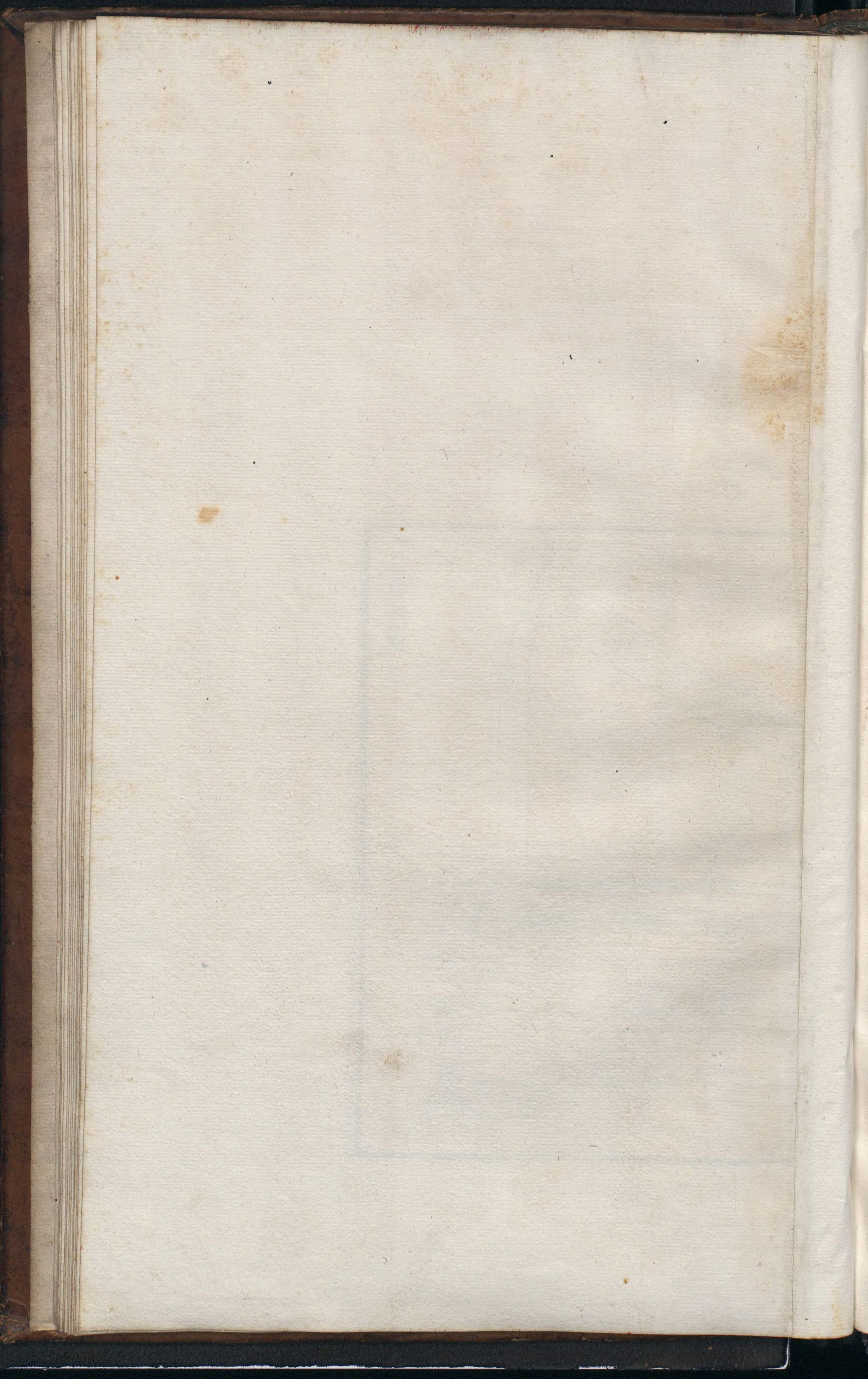
朝內午門前。內院大臣。公定表高。二尺二寸。如甲丙。預推日影。四尺三寸四分五厘。如甲乙。

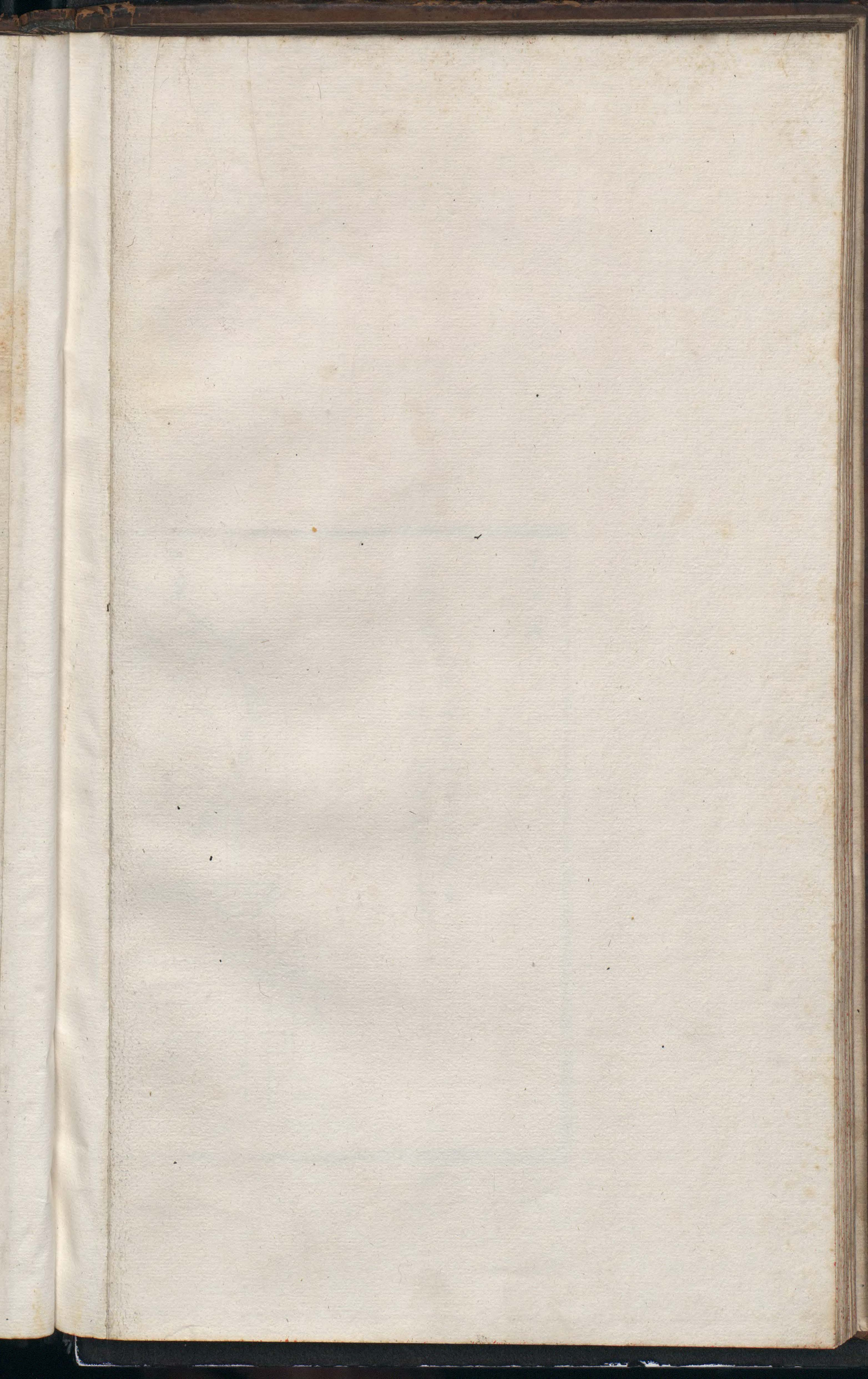
丙
乙
尺四
尺三
尺二
尺一
甲
B

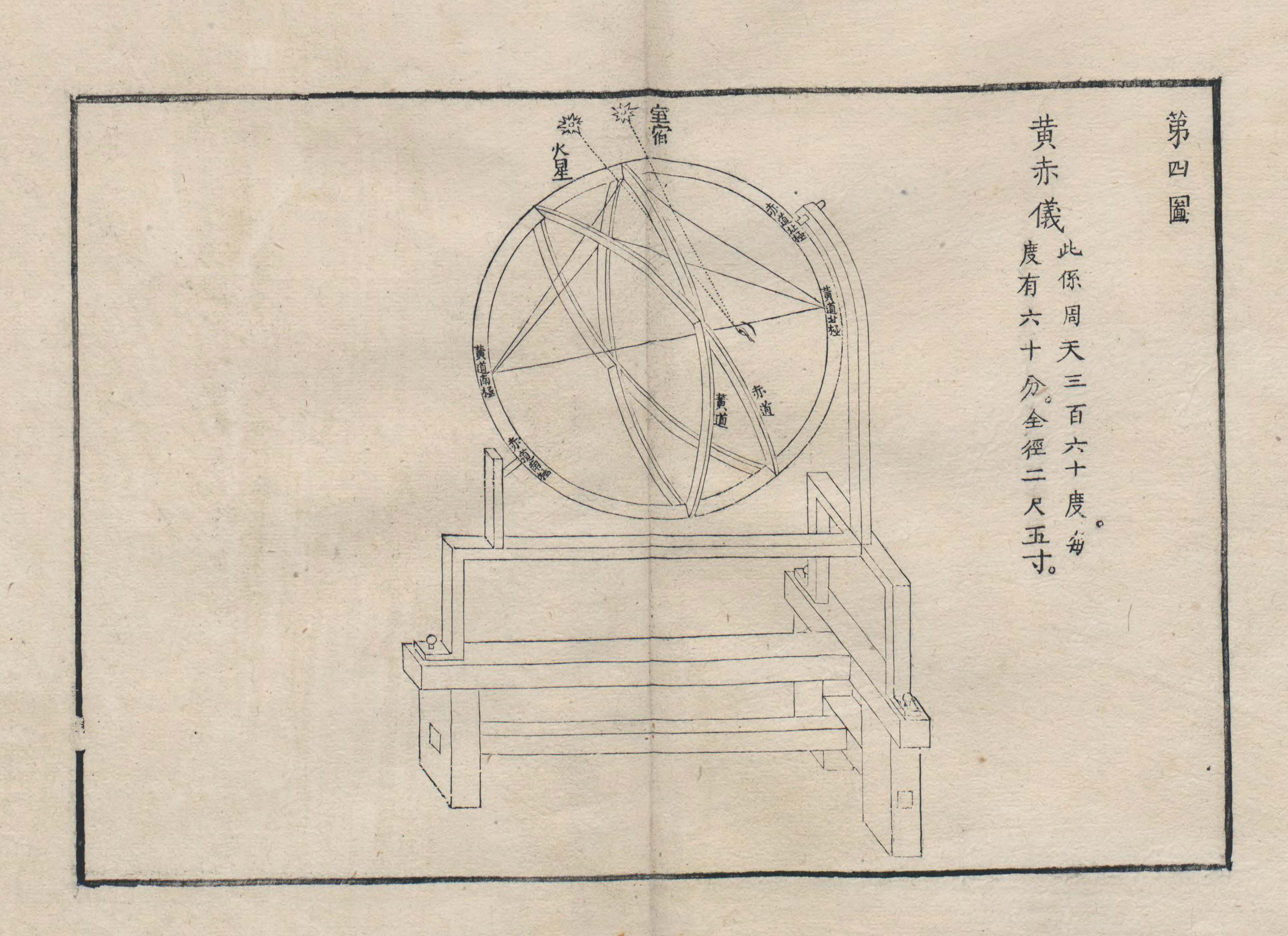





第三圖
觀象臺。新定表高。八尺零五分五厘。如甲丙。預推日影。一丈五尺八寸三分。如甲乙。
丙
甲
乙

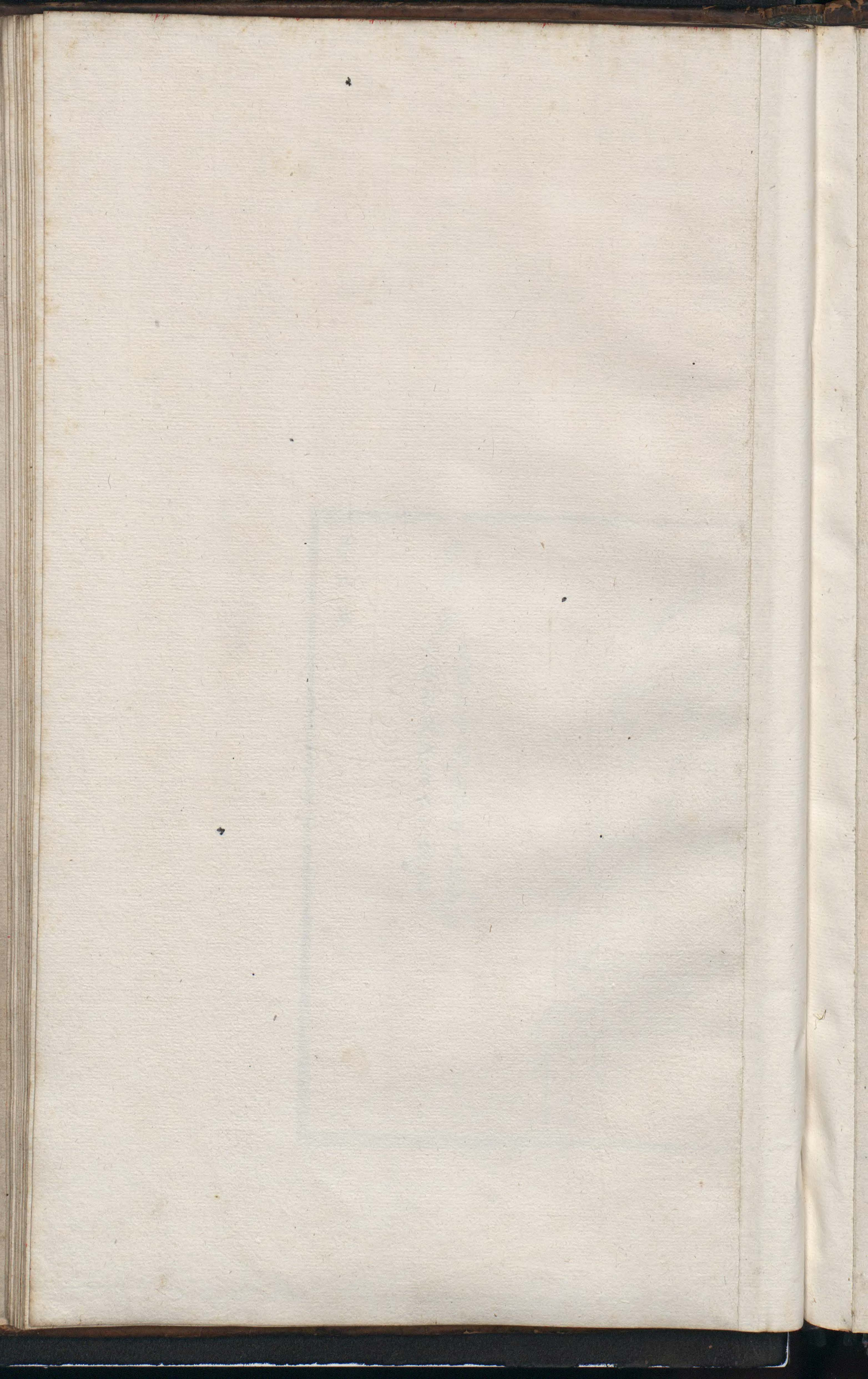


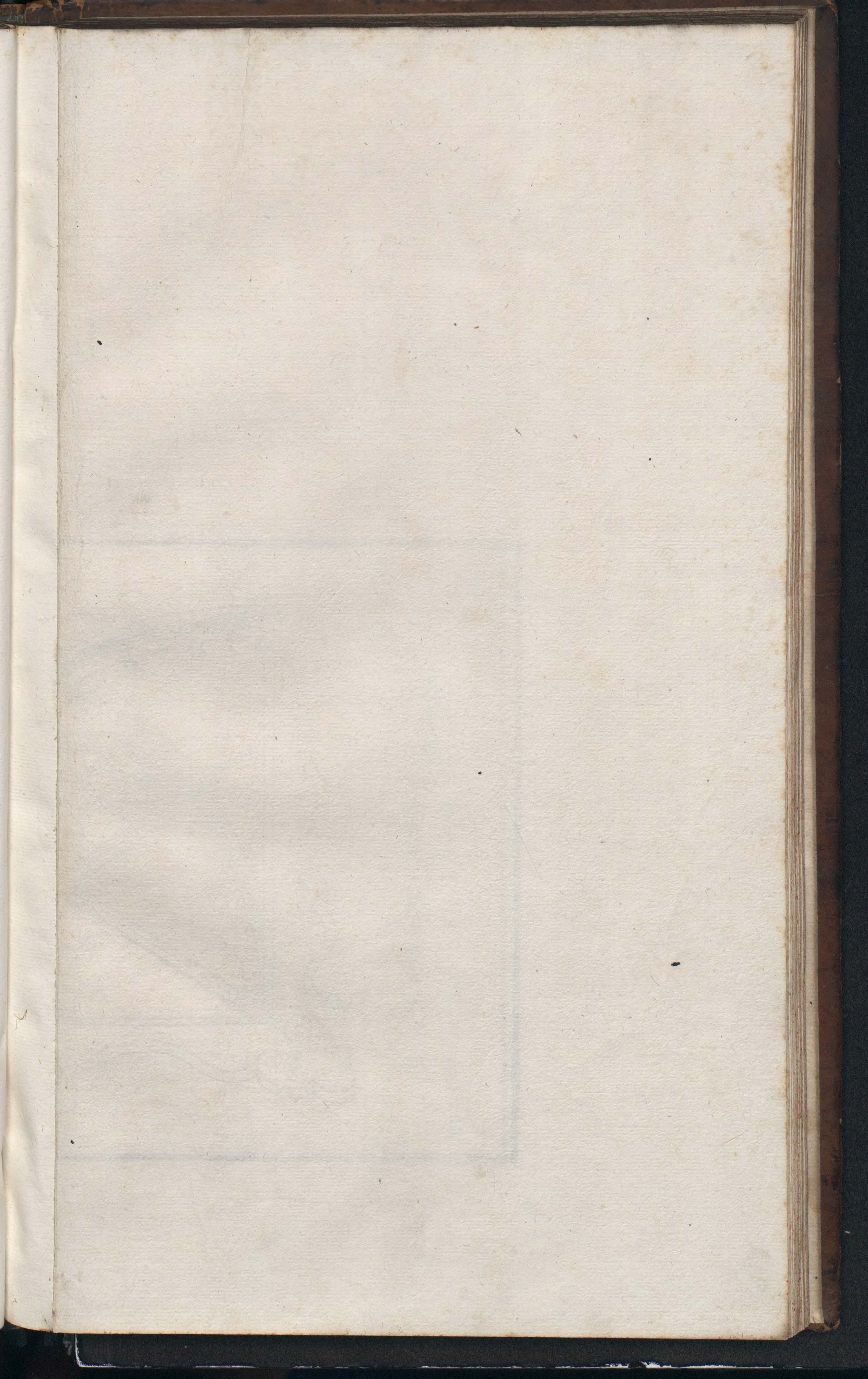




第四圖

黃赤儀此係周天三百六十度。每度有六十分。全徑二尺五寸。

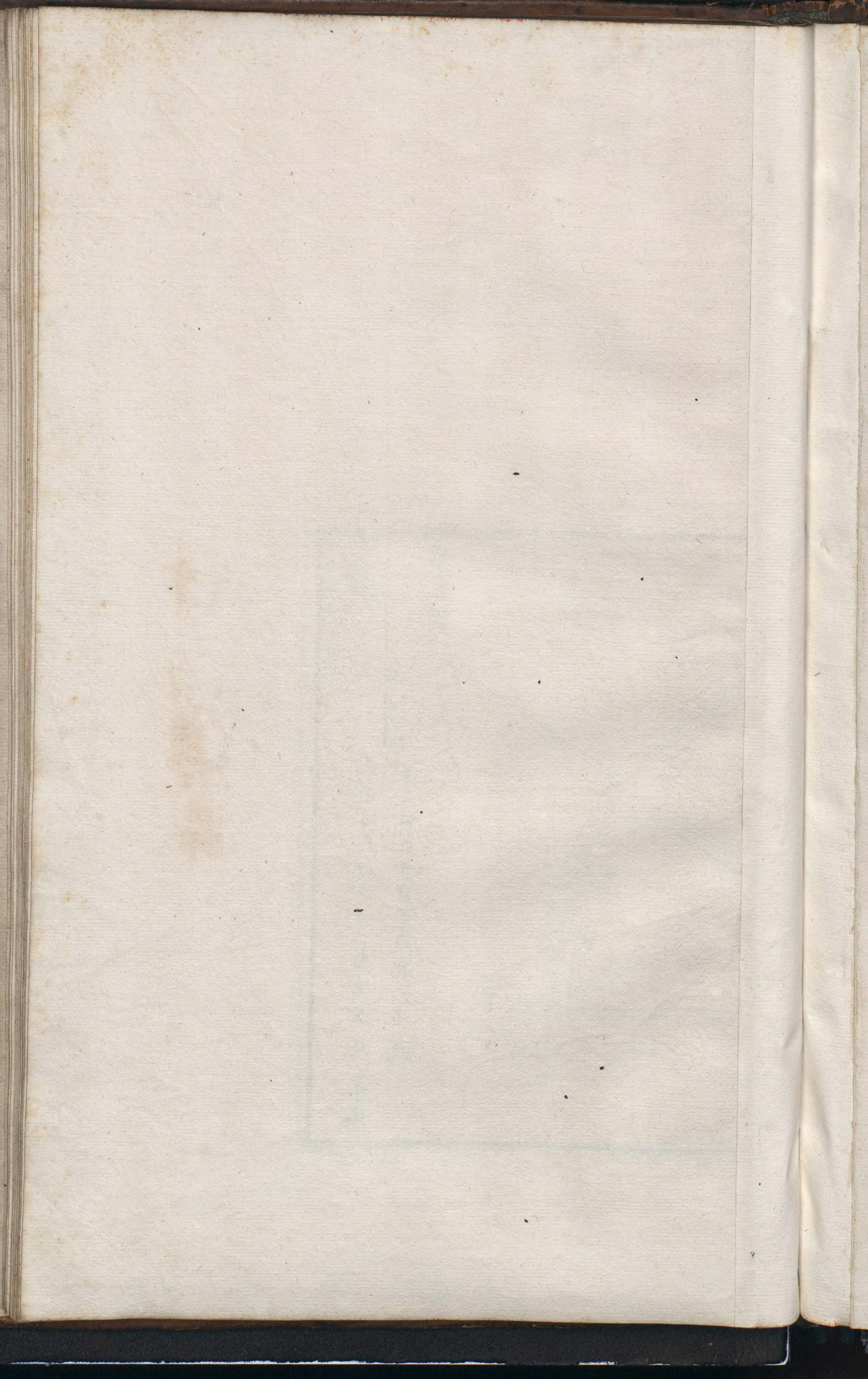


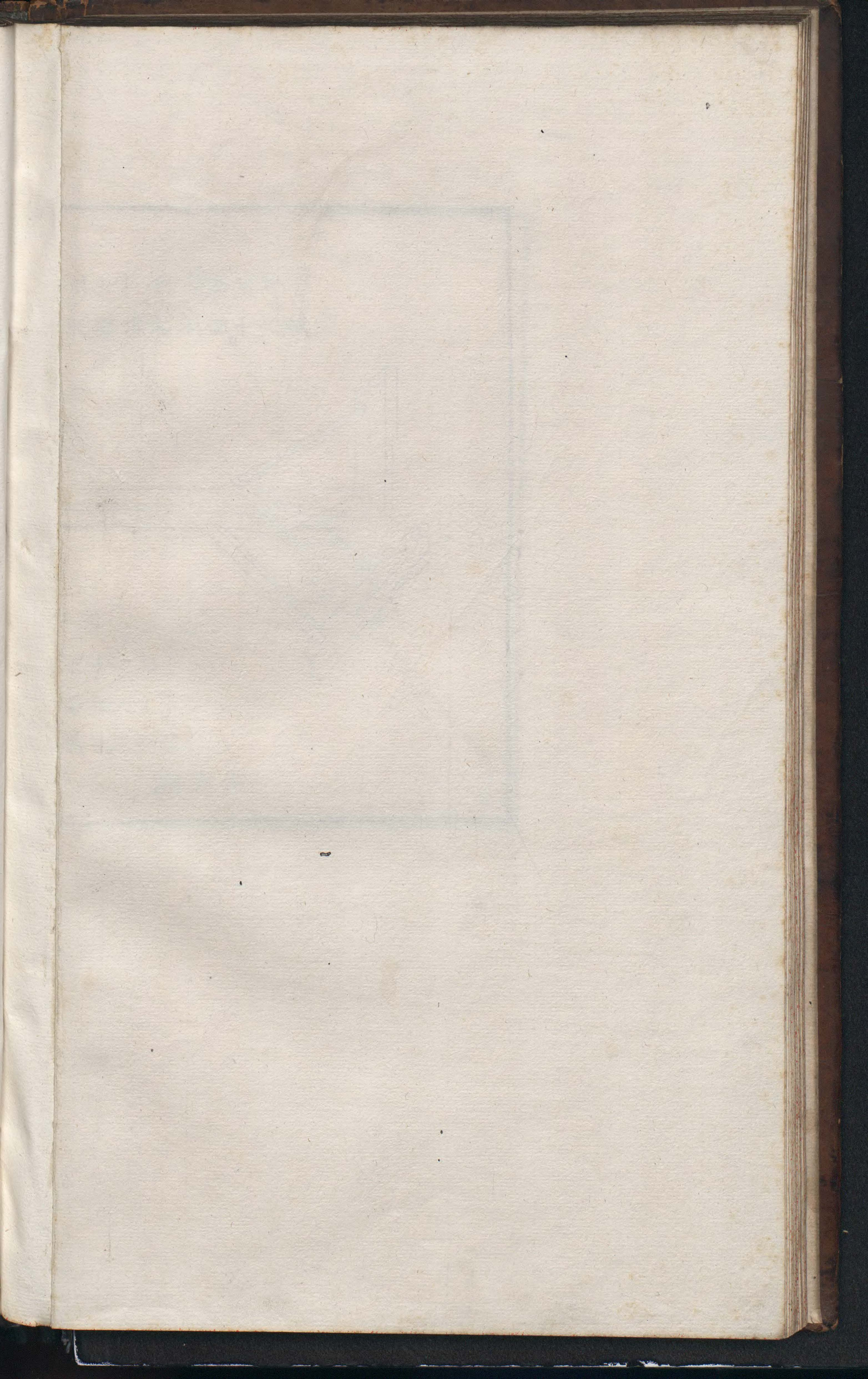


第五圖

象限儀

此係周天四分之一。全徑五尺二寸。其弧分有九十度。每度有六十分。

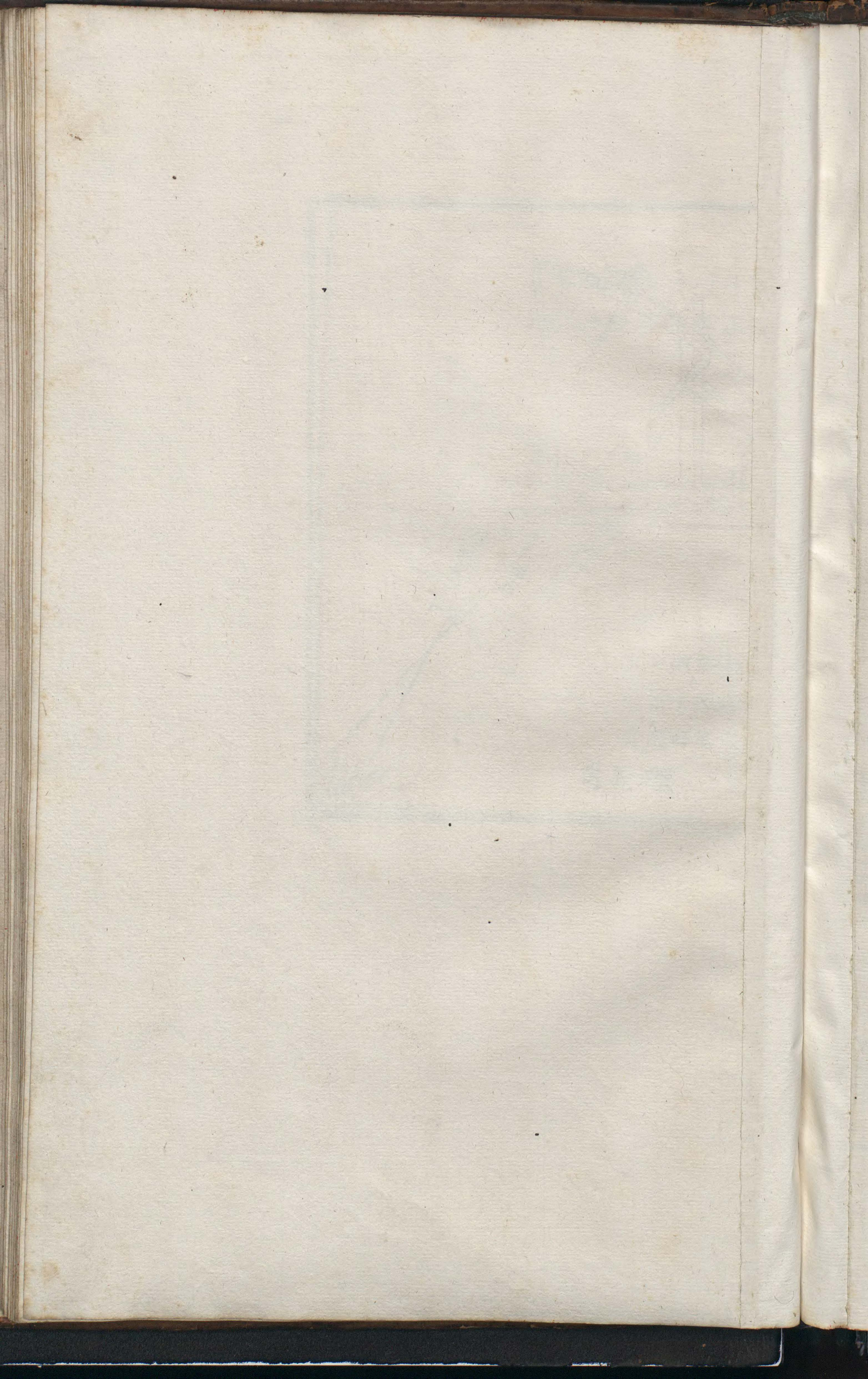


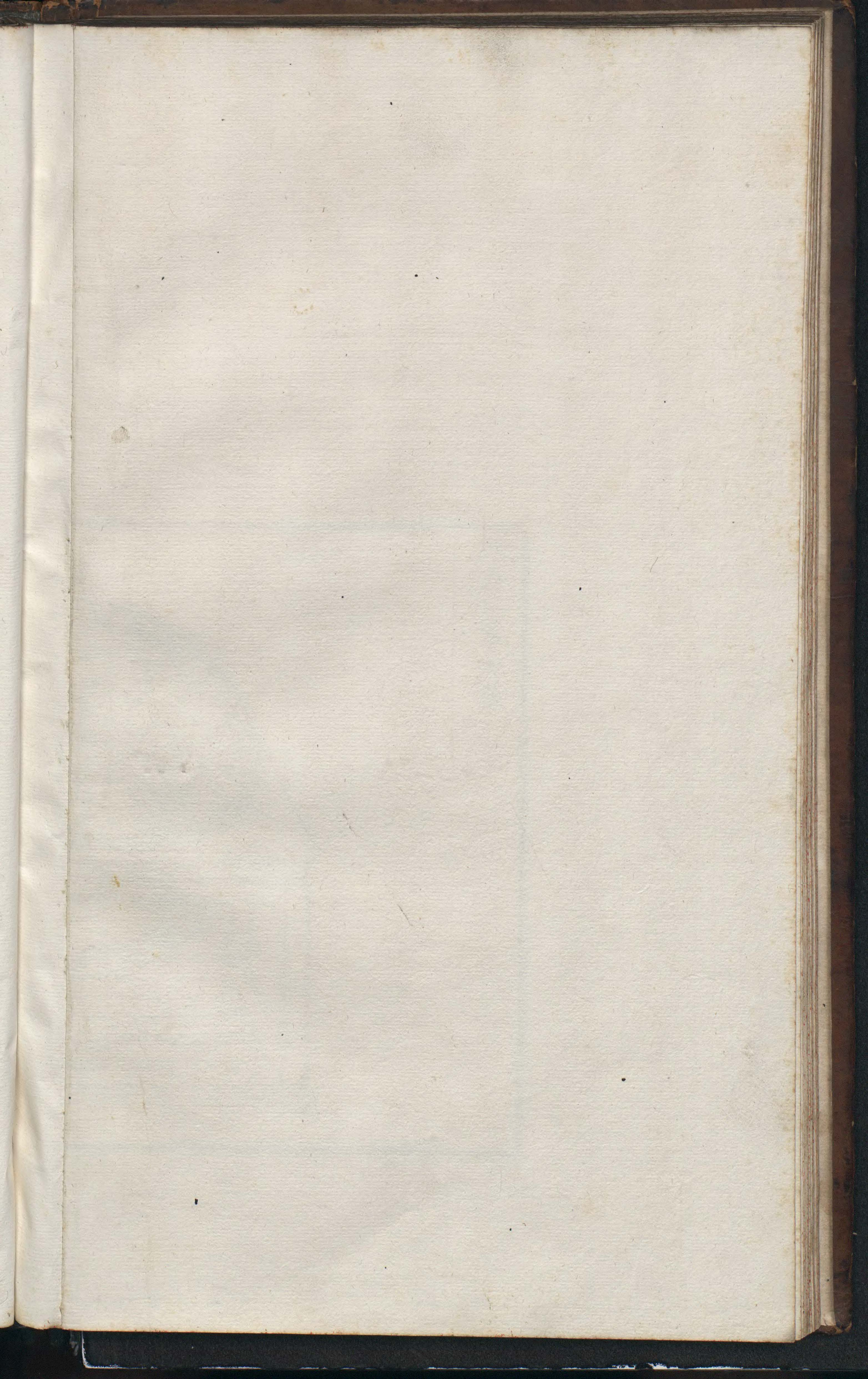


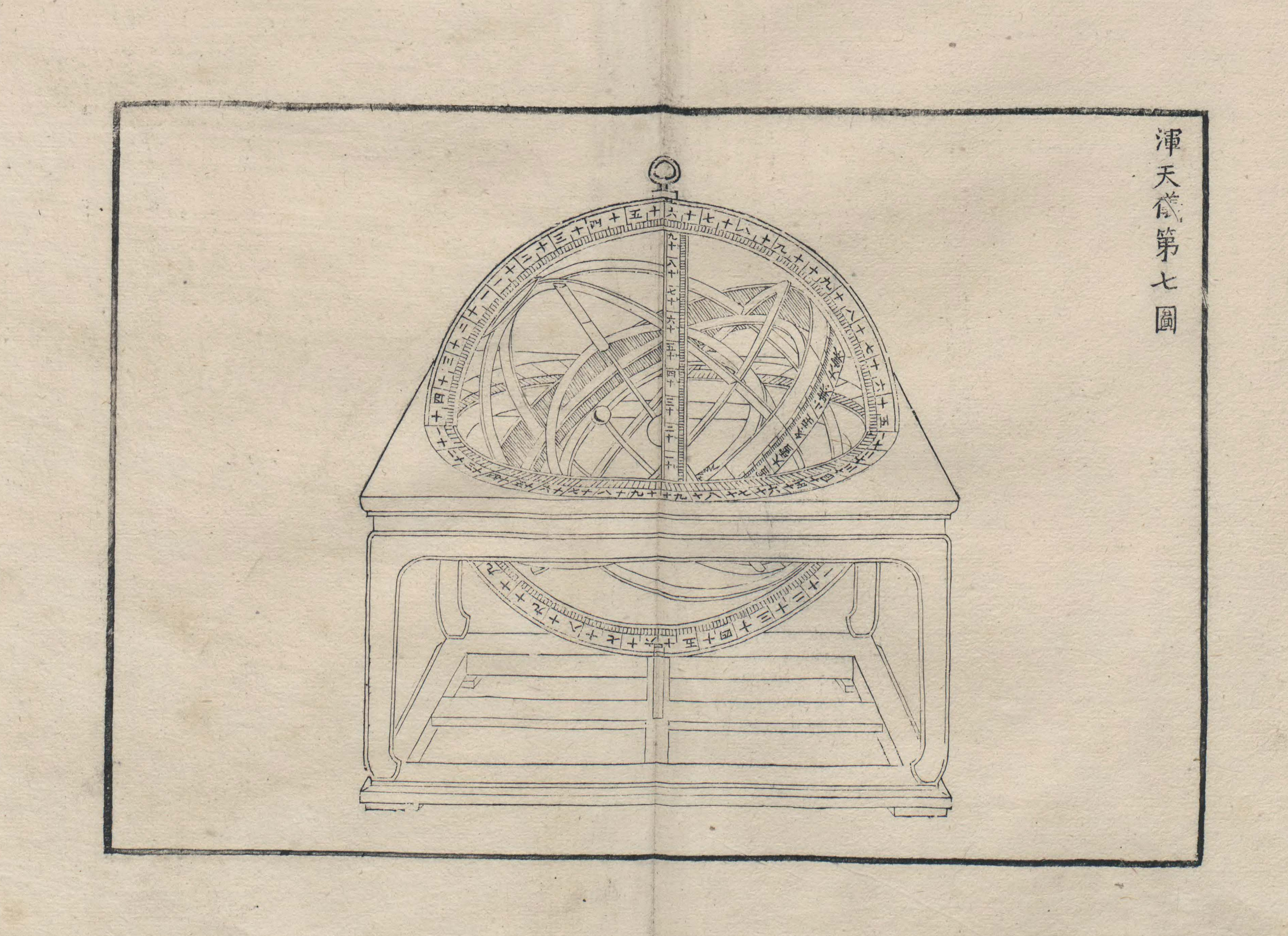
紀限儀

此係周天六分之一。全徑一丈。其弧分有六十度。每度有六十分

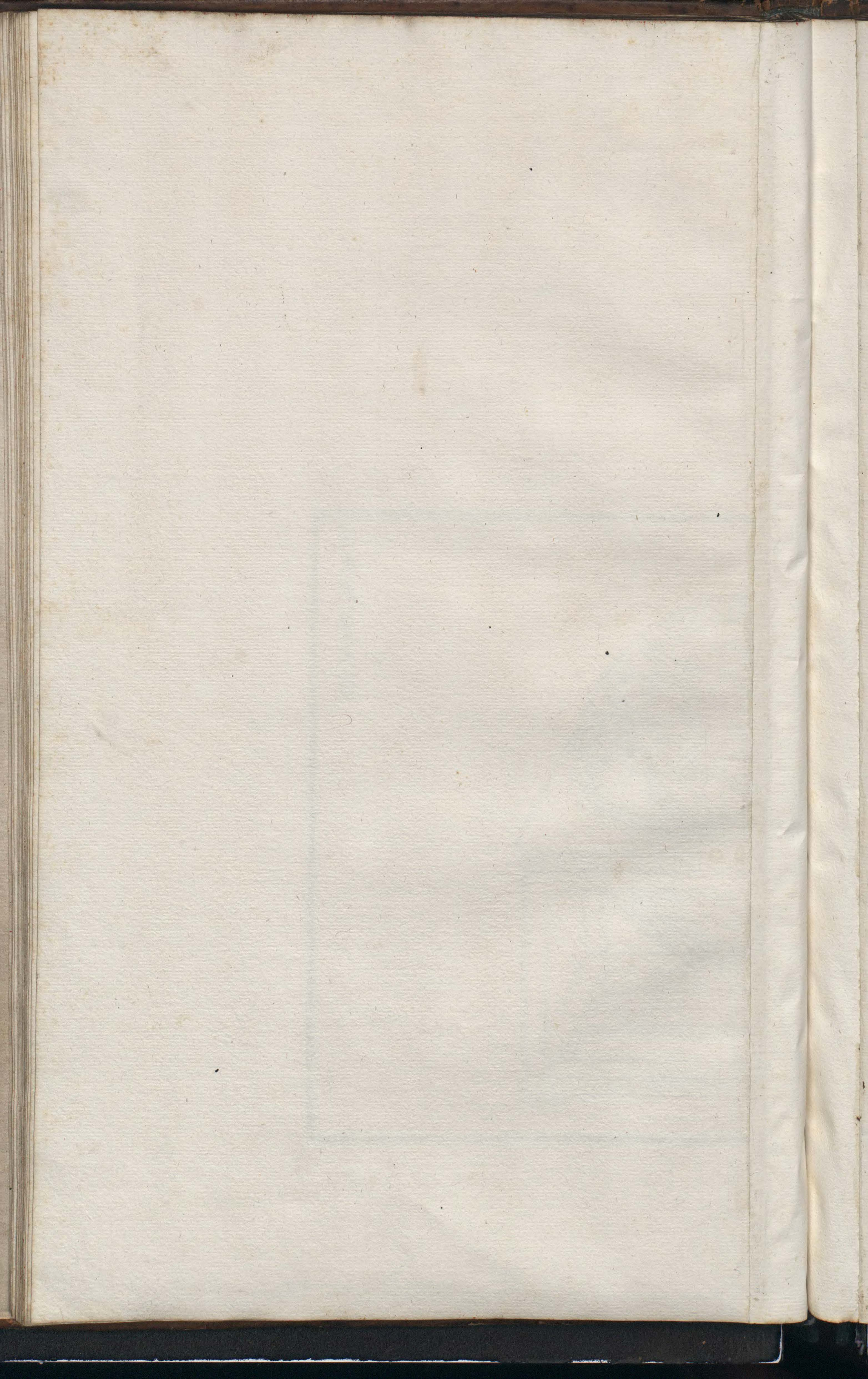
太陽在赤道南。十六度二十一分。如甲乙弧。

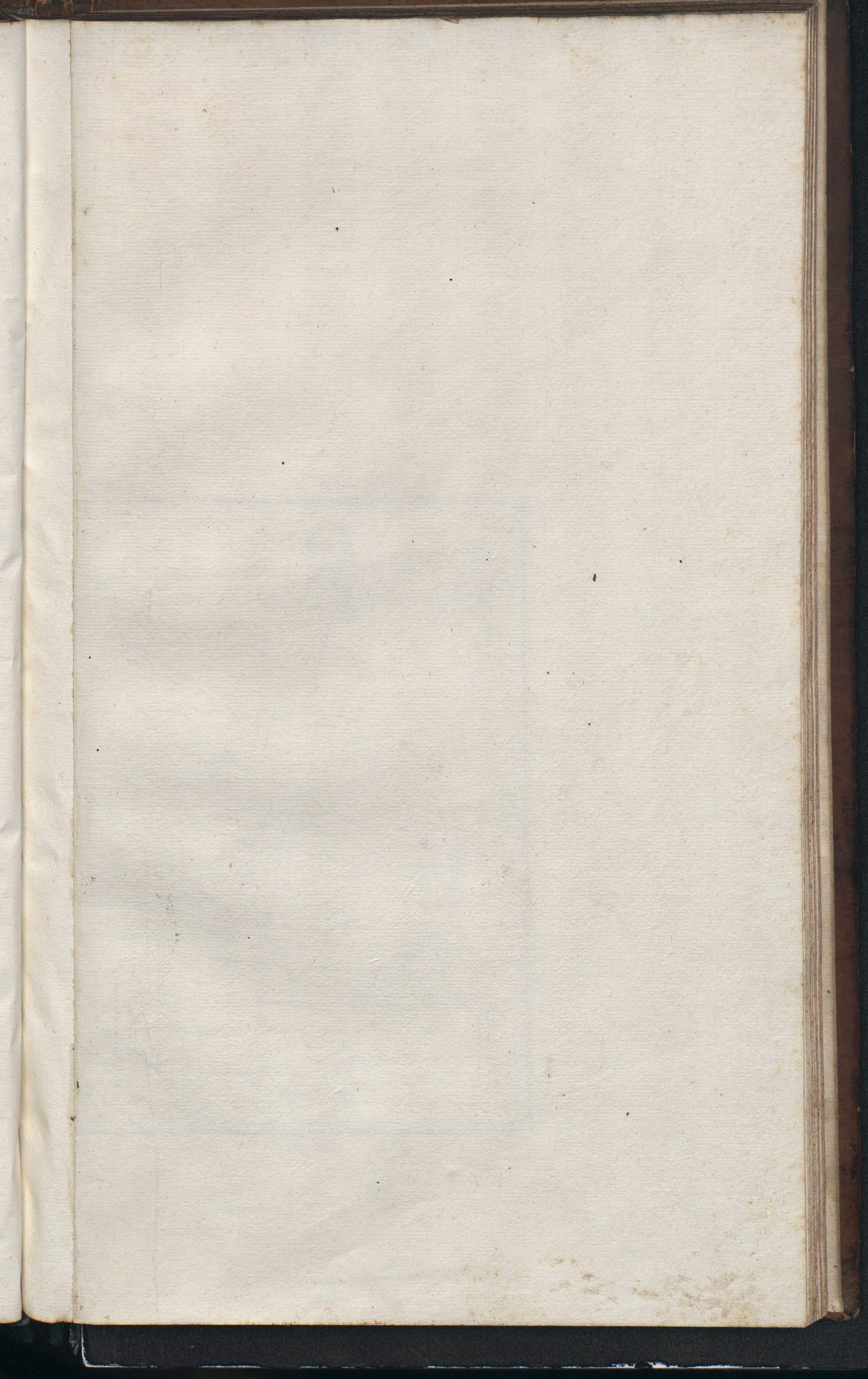


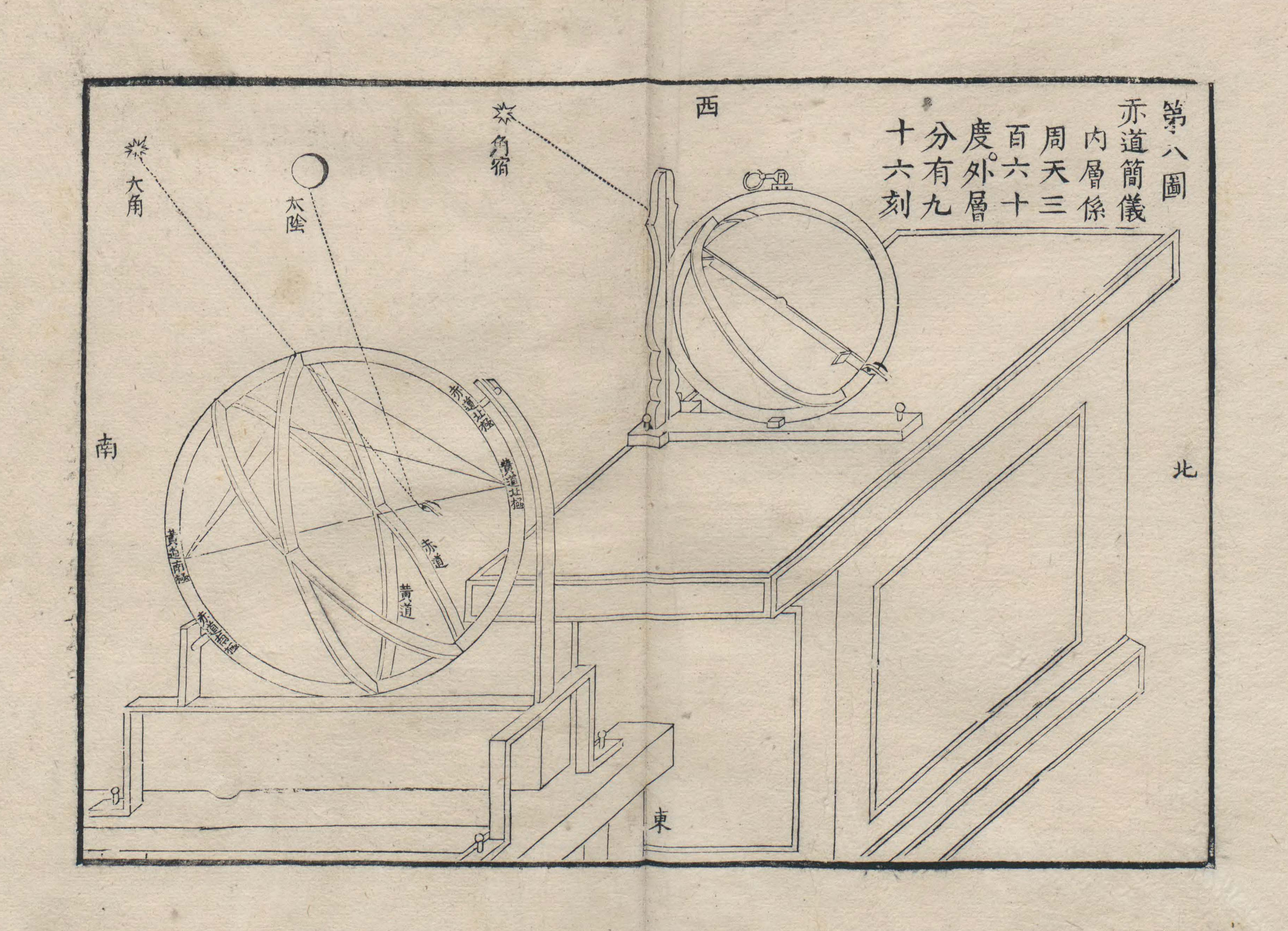




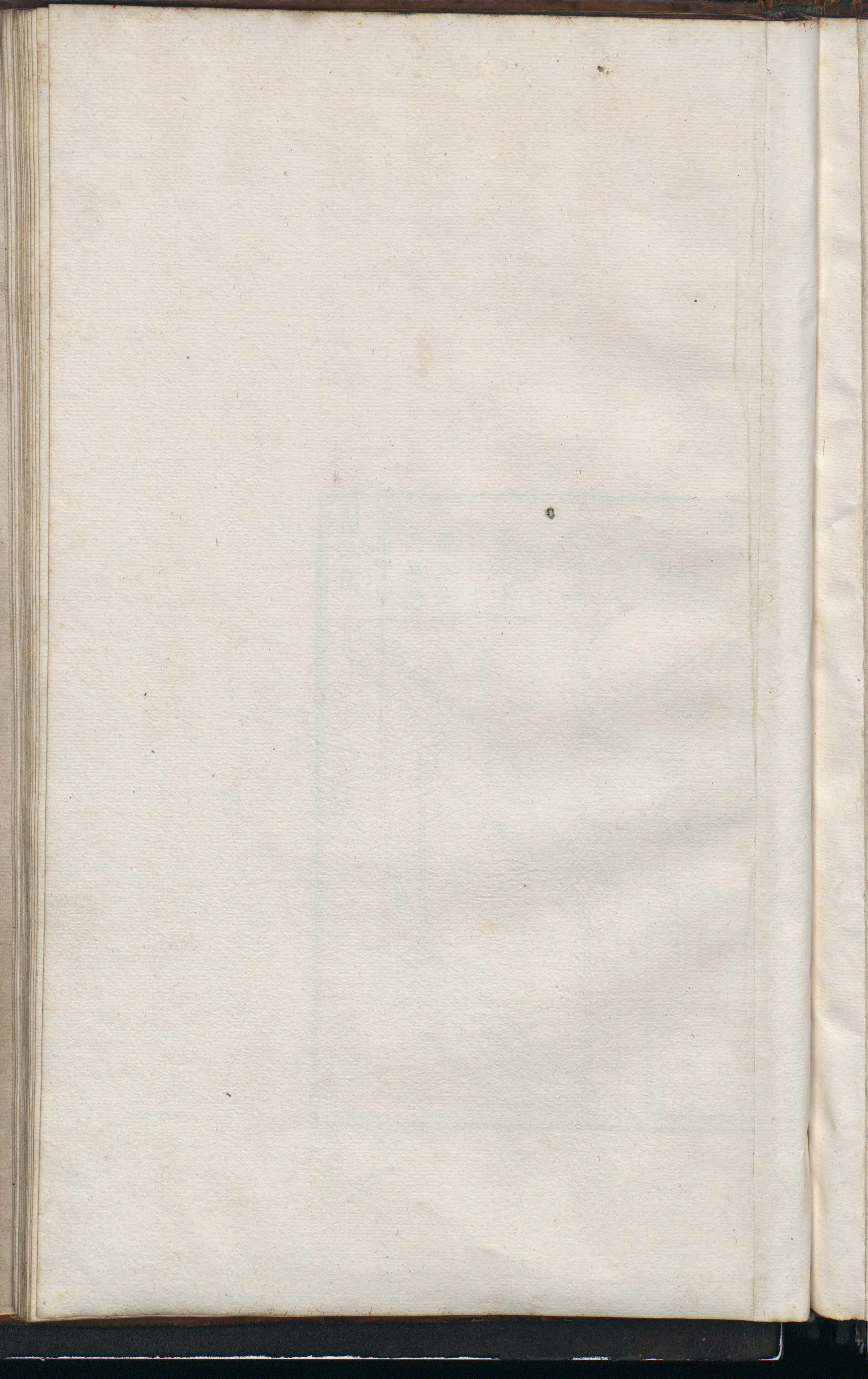
渾天儀第七圖

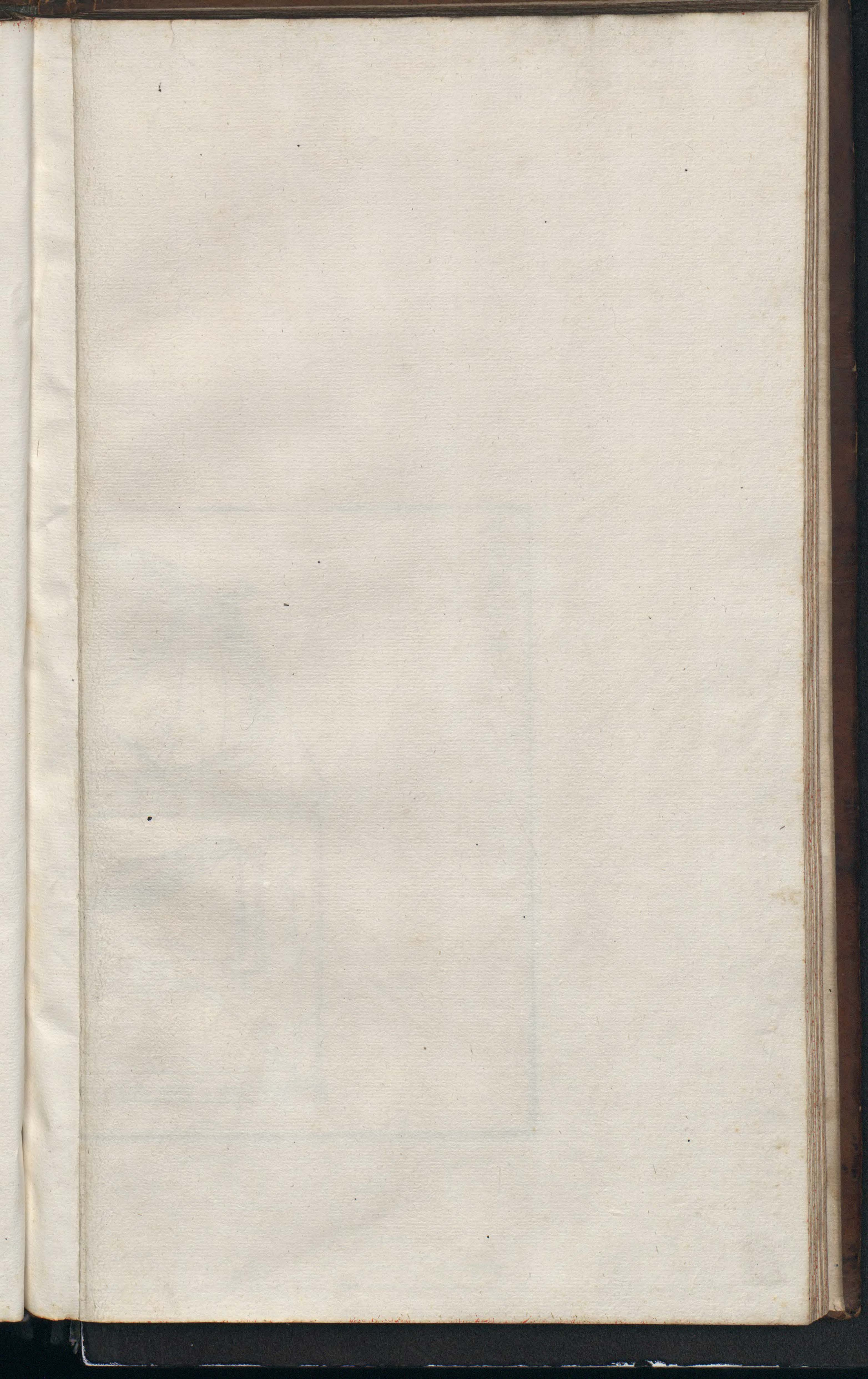


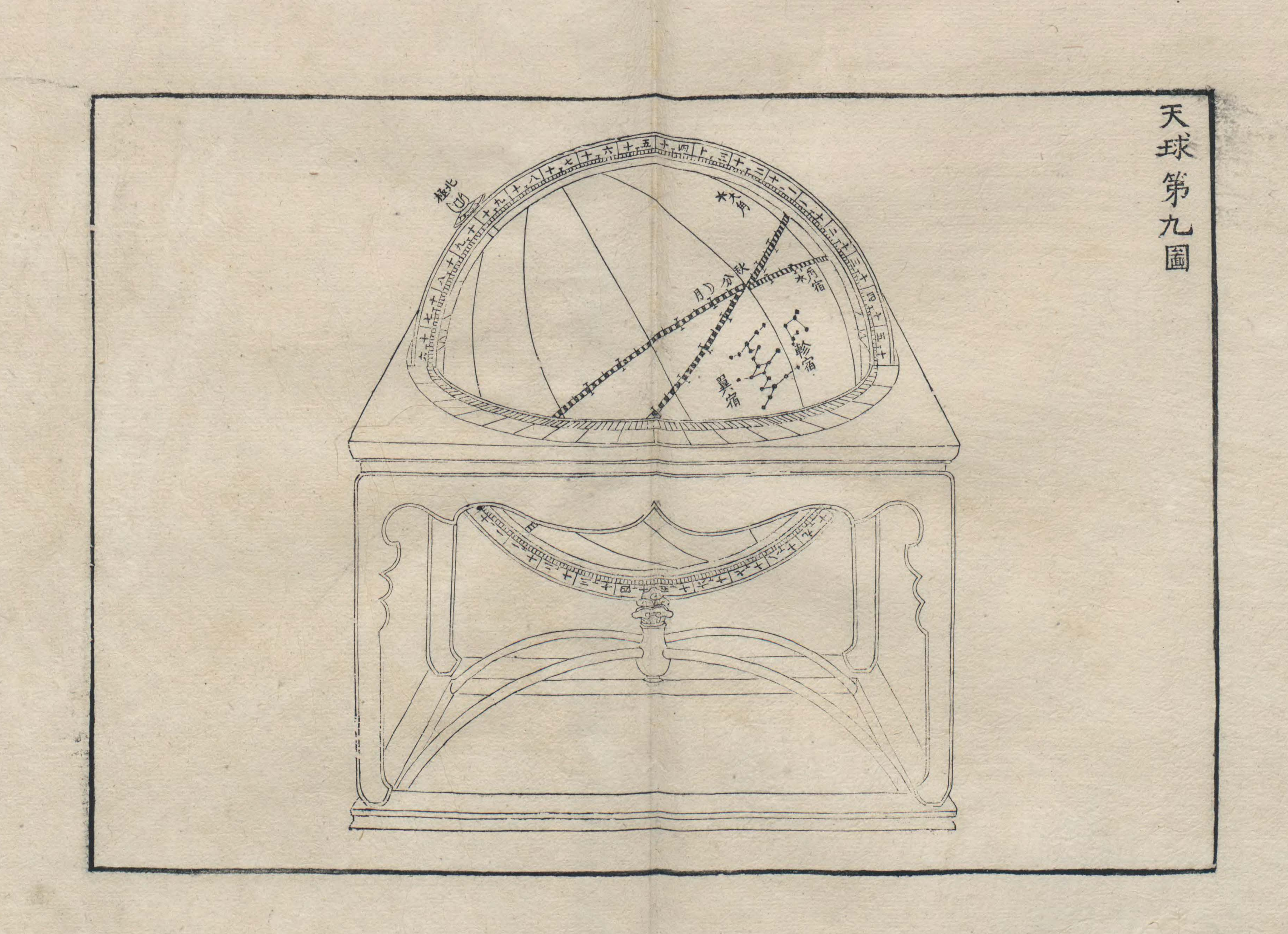




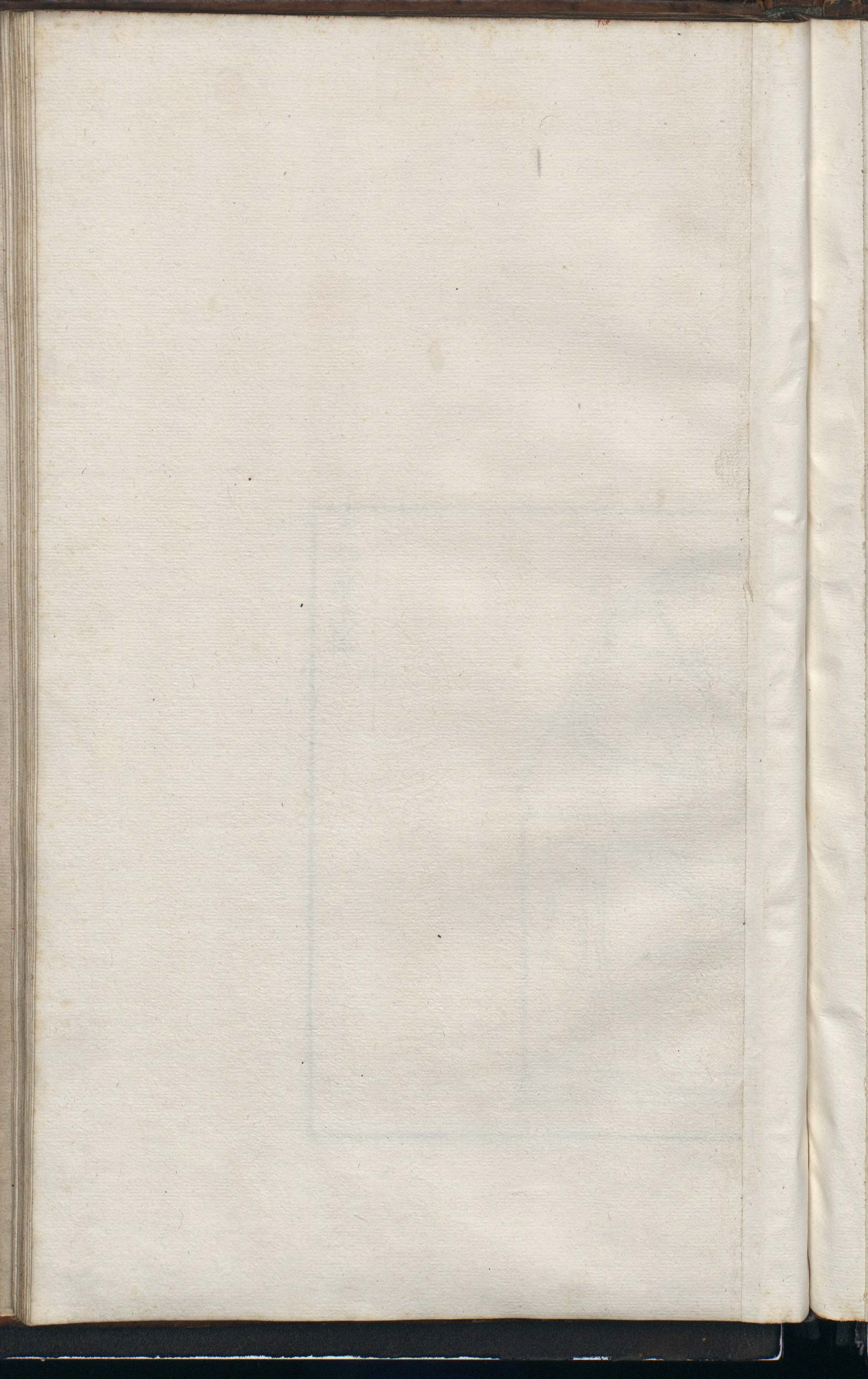
第八圖 赤道簡儀 內層係周天三百六十度。外層分有九十六刻

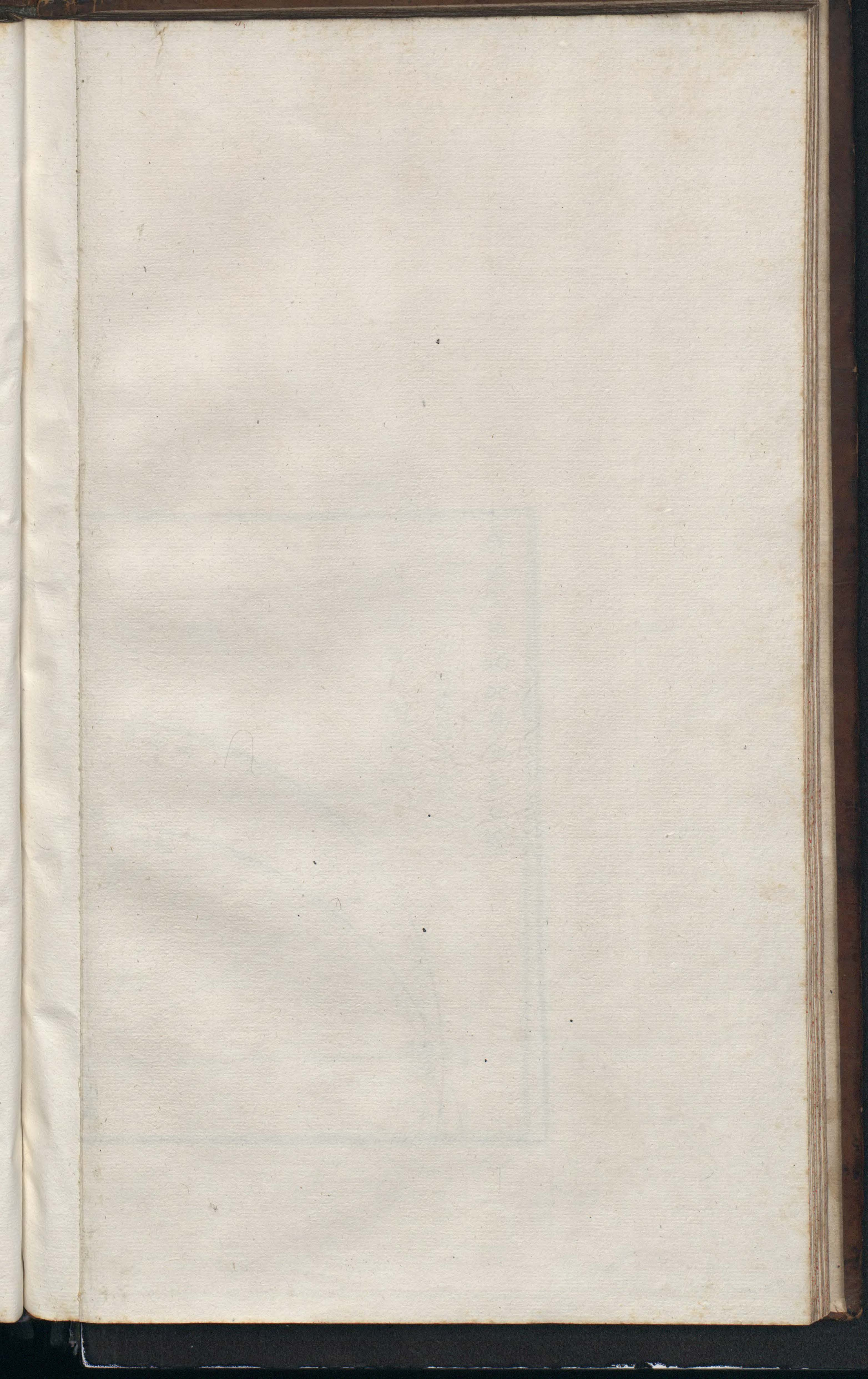


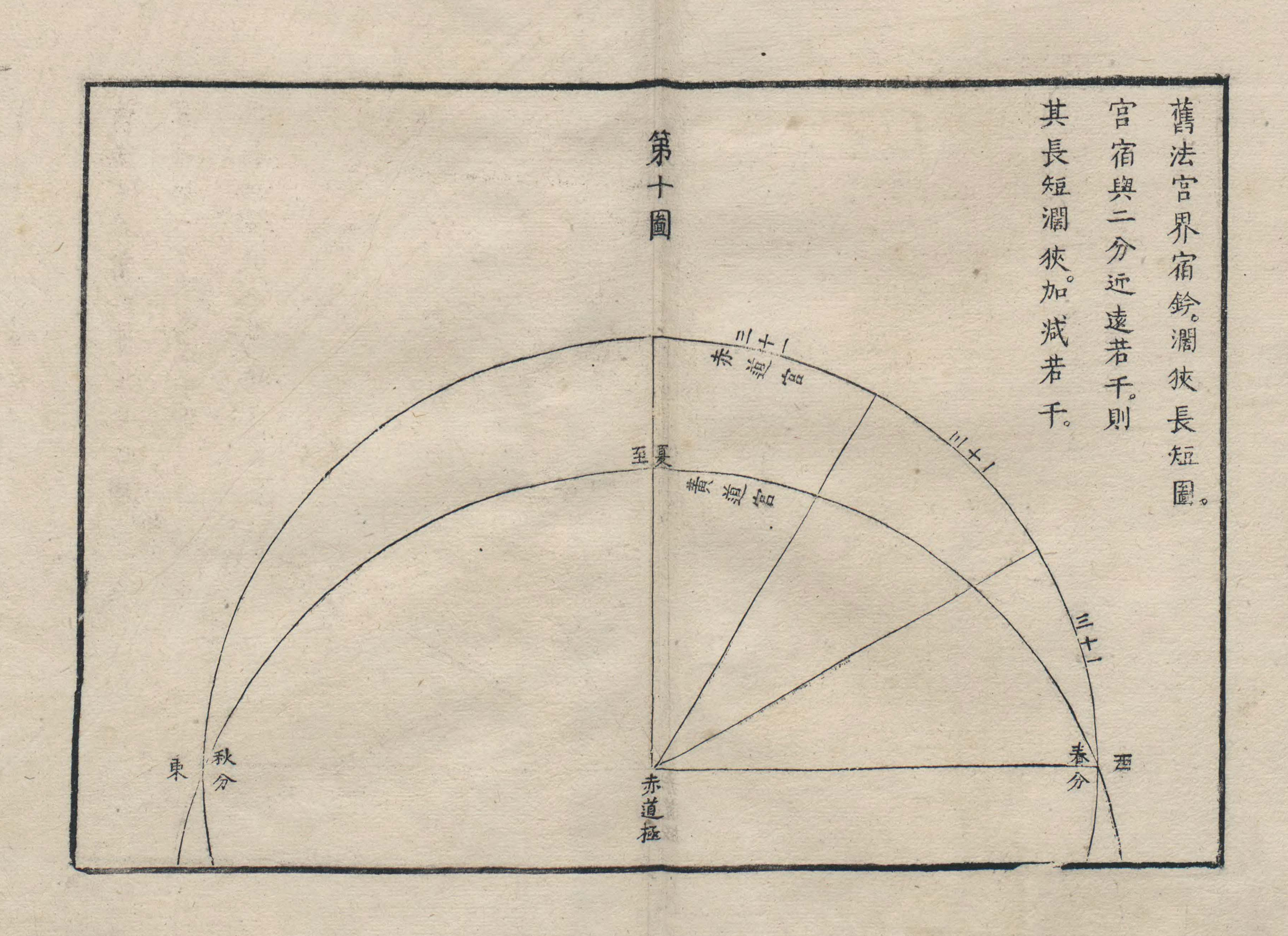




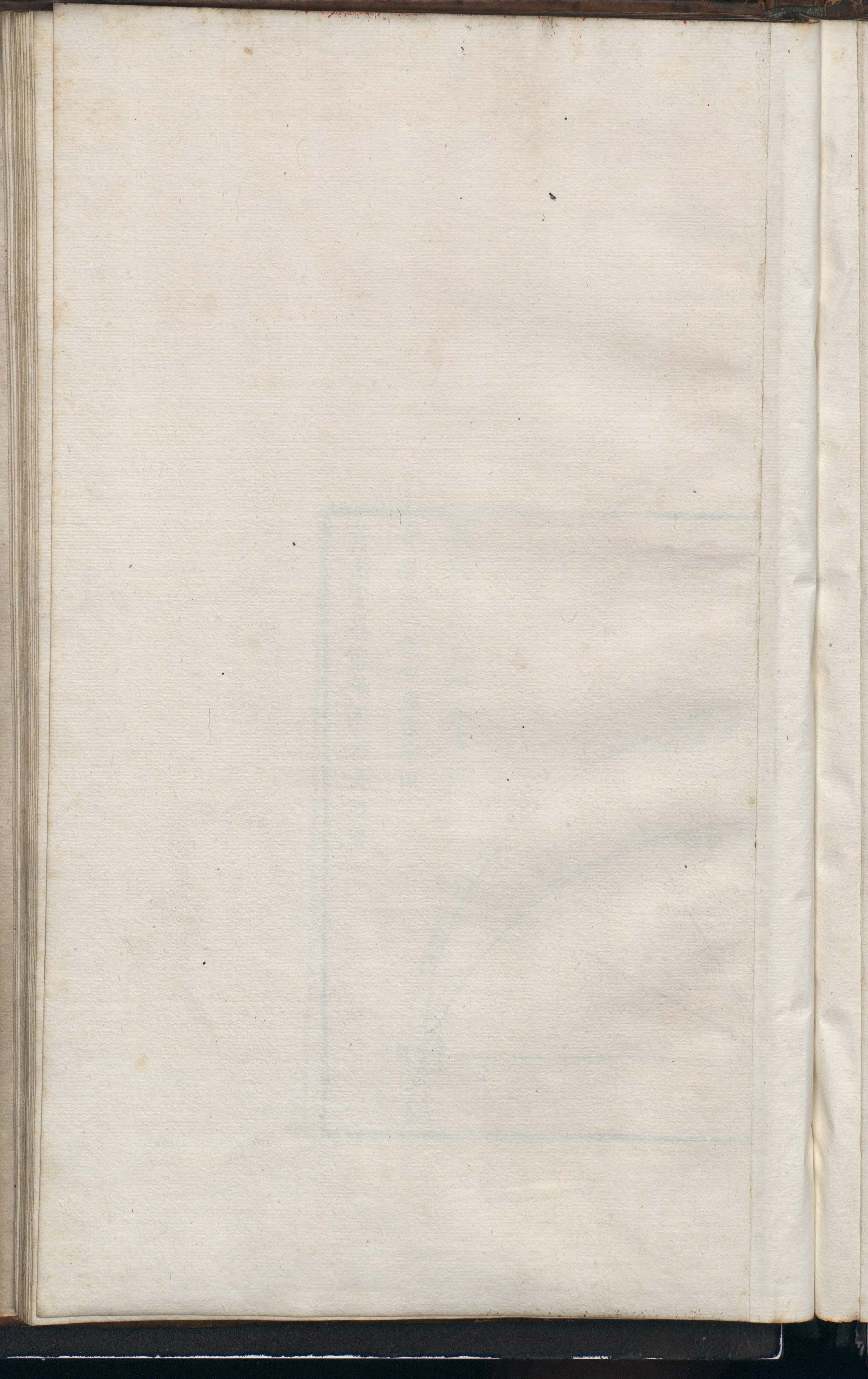
天球第九圖

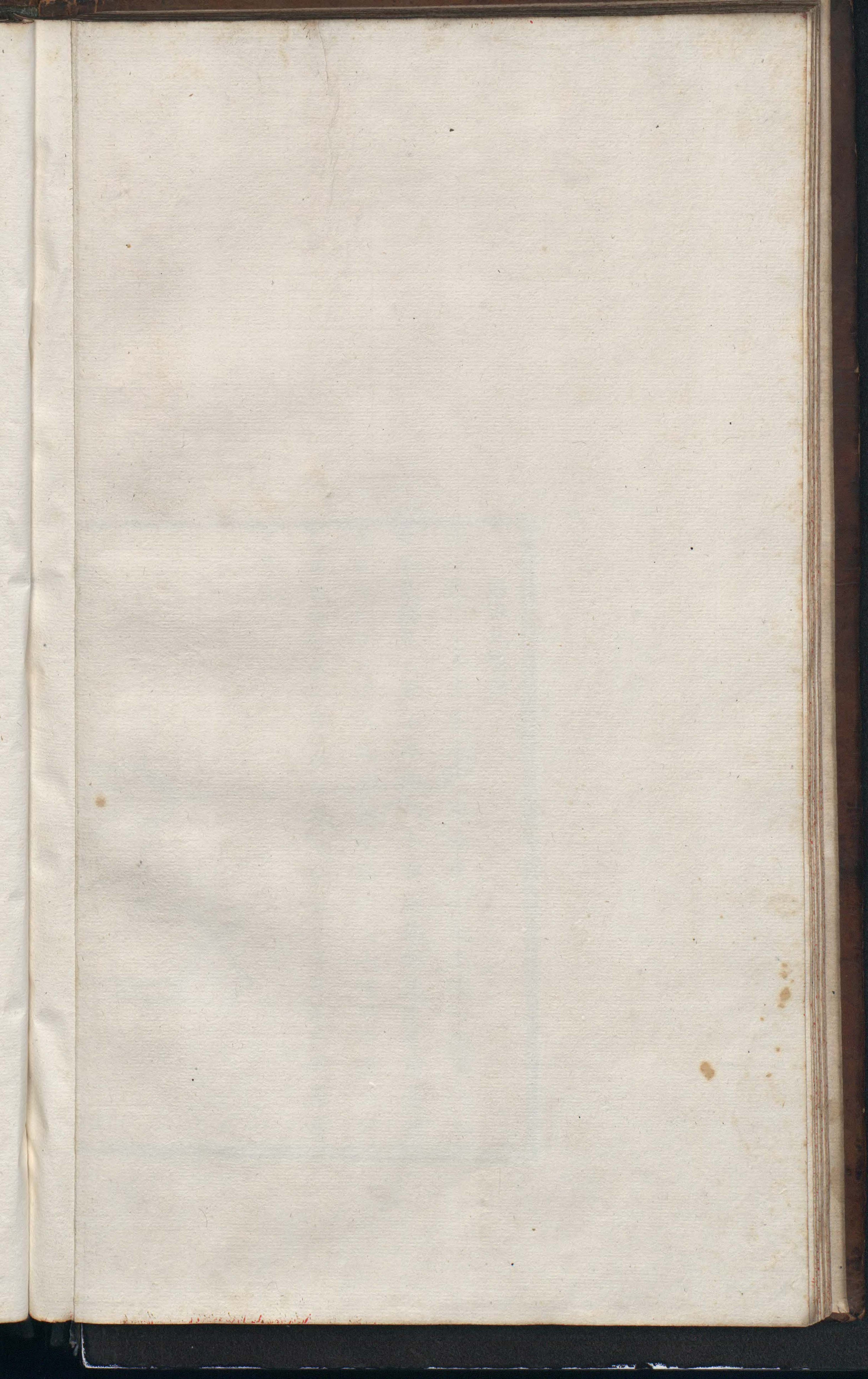






舊法宮界宿鈐。濶狹長短圖。
宮宿與二分近遠若干。則
其長短濶狹。加減若干。

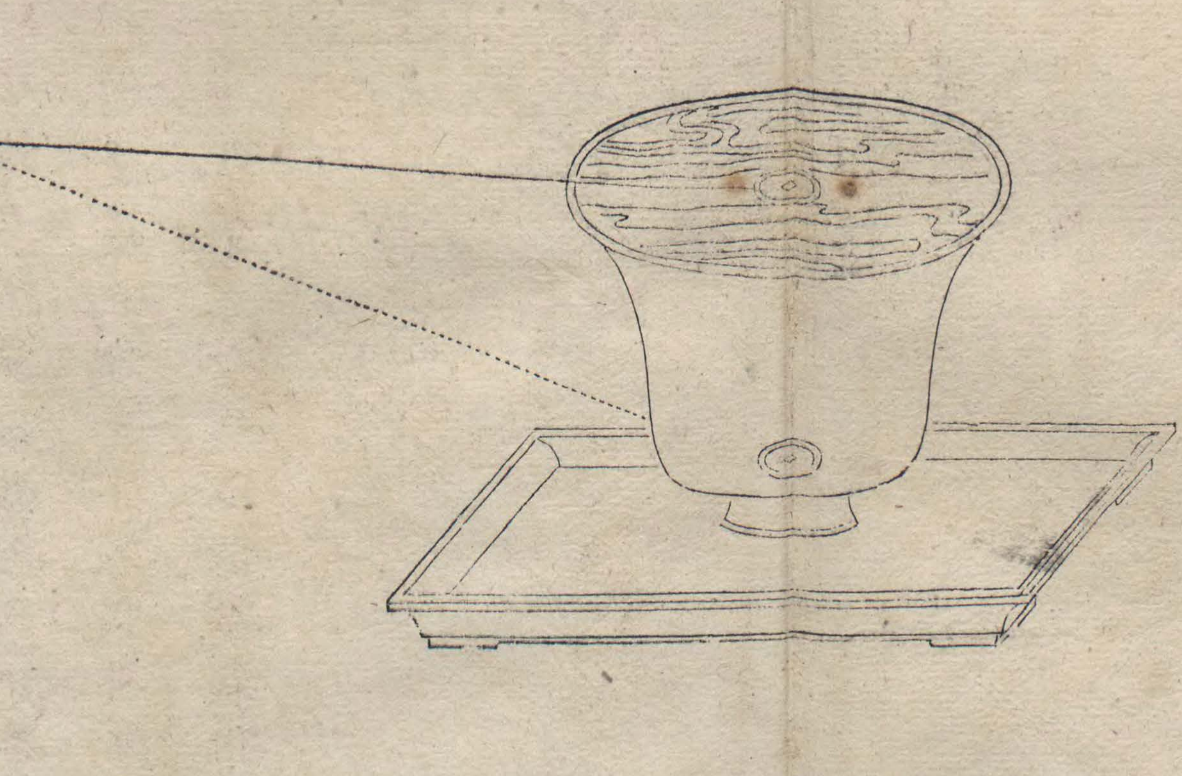


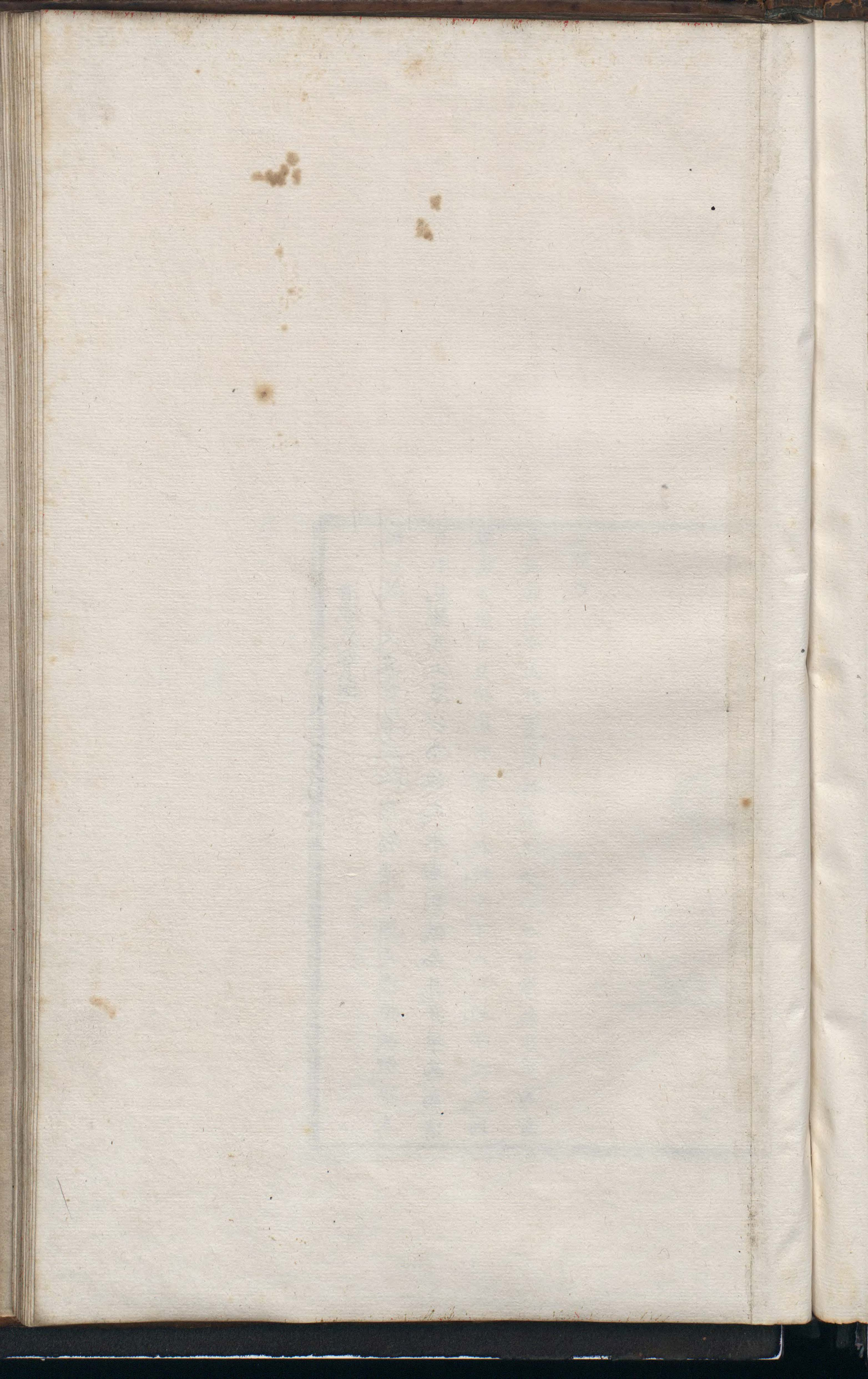


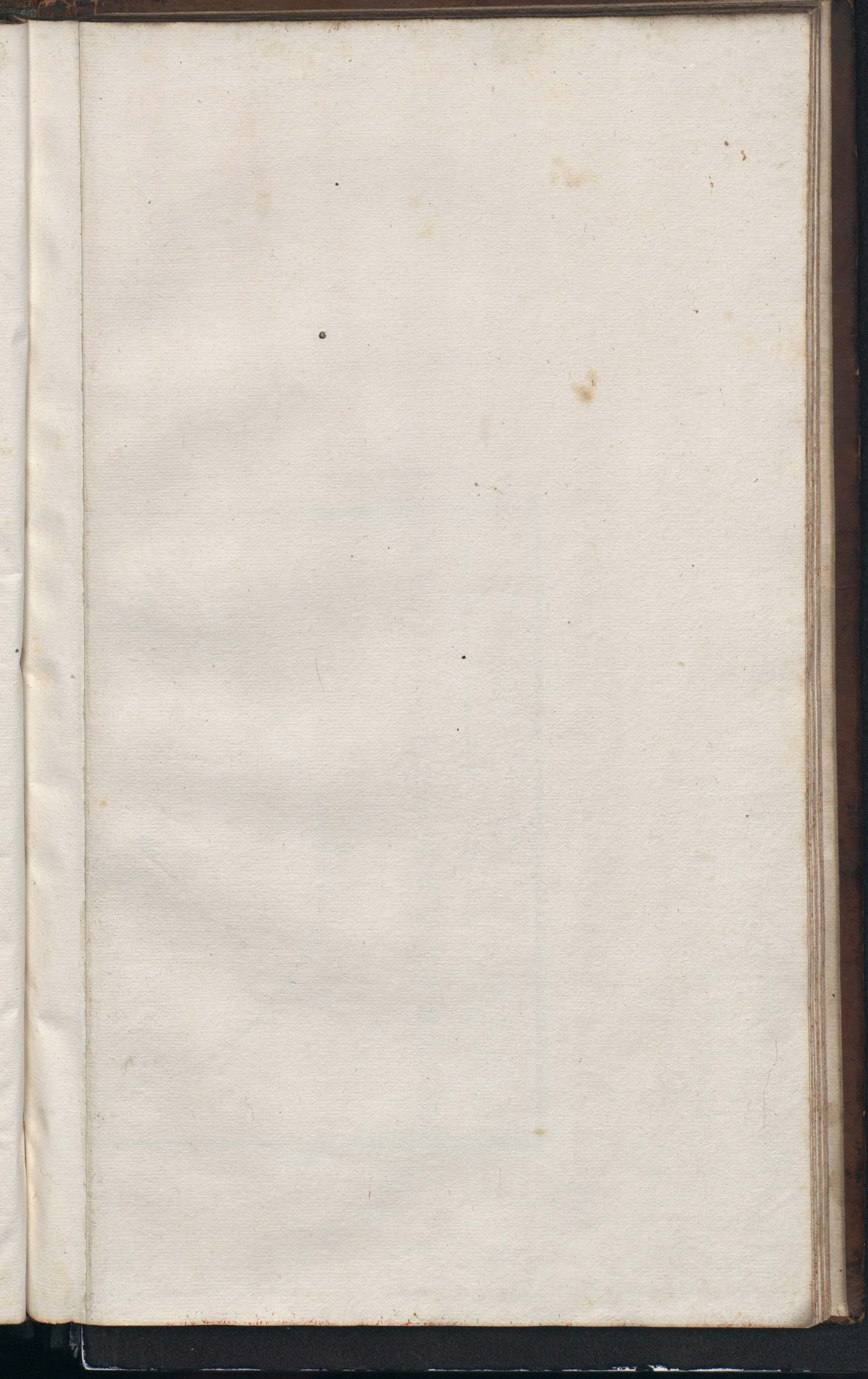
清濛氣譬圖

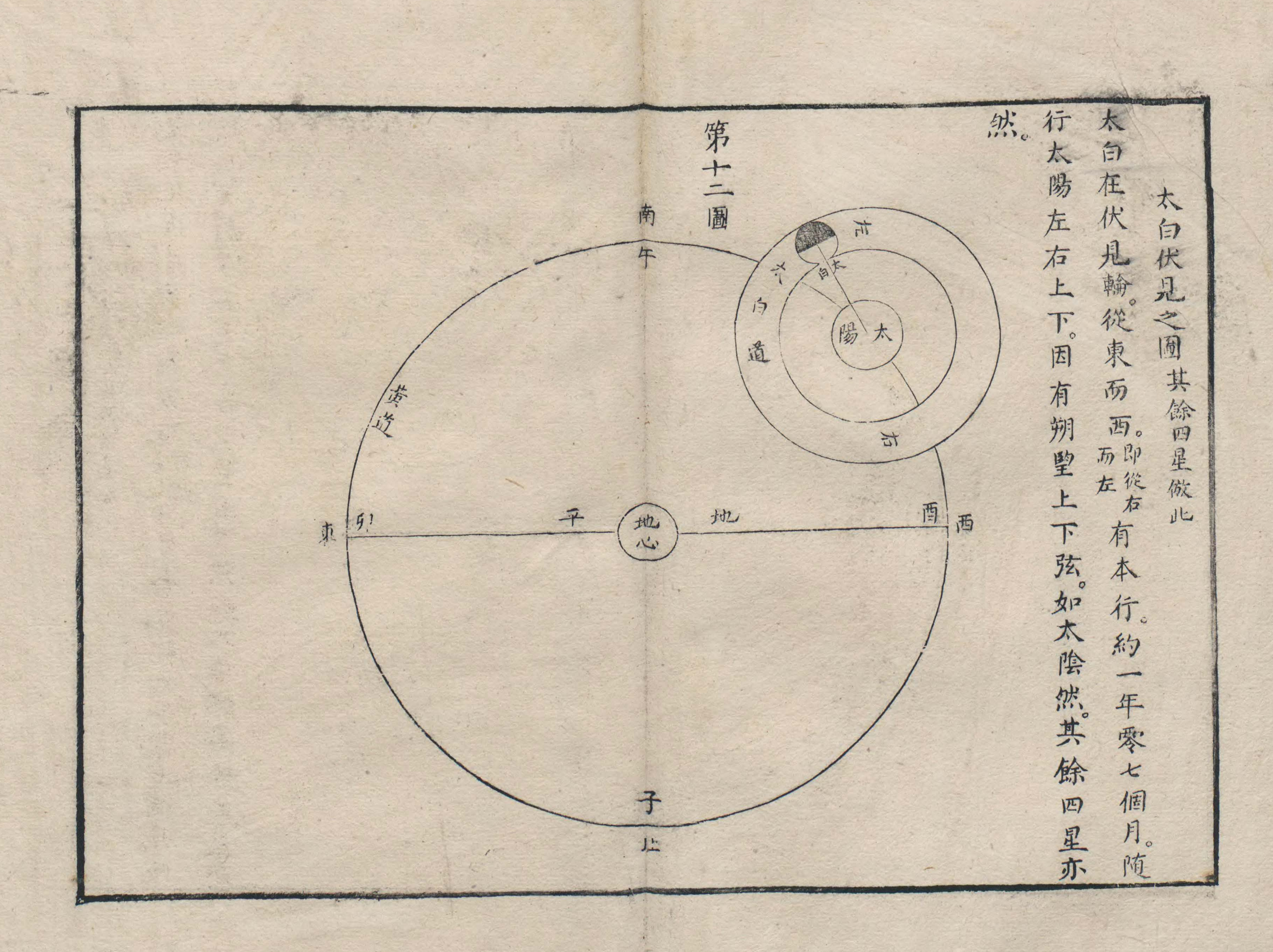
試以錢一文。置空盞底。人立稍遠。令盞之邊掩錢體。以人目不見錢爲止。若以水注之。水滿則錢全見。升卑爲高。清濛氣亦然。日月將出時。實處在地平下。人從地平視之。則見其在地平上。此實處視處之分別。乃清濛氣升卑爲高之故也。

第十一圖



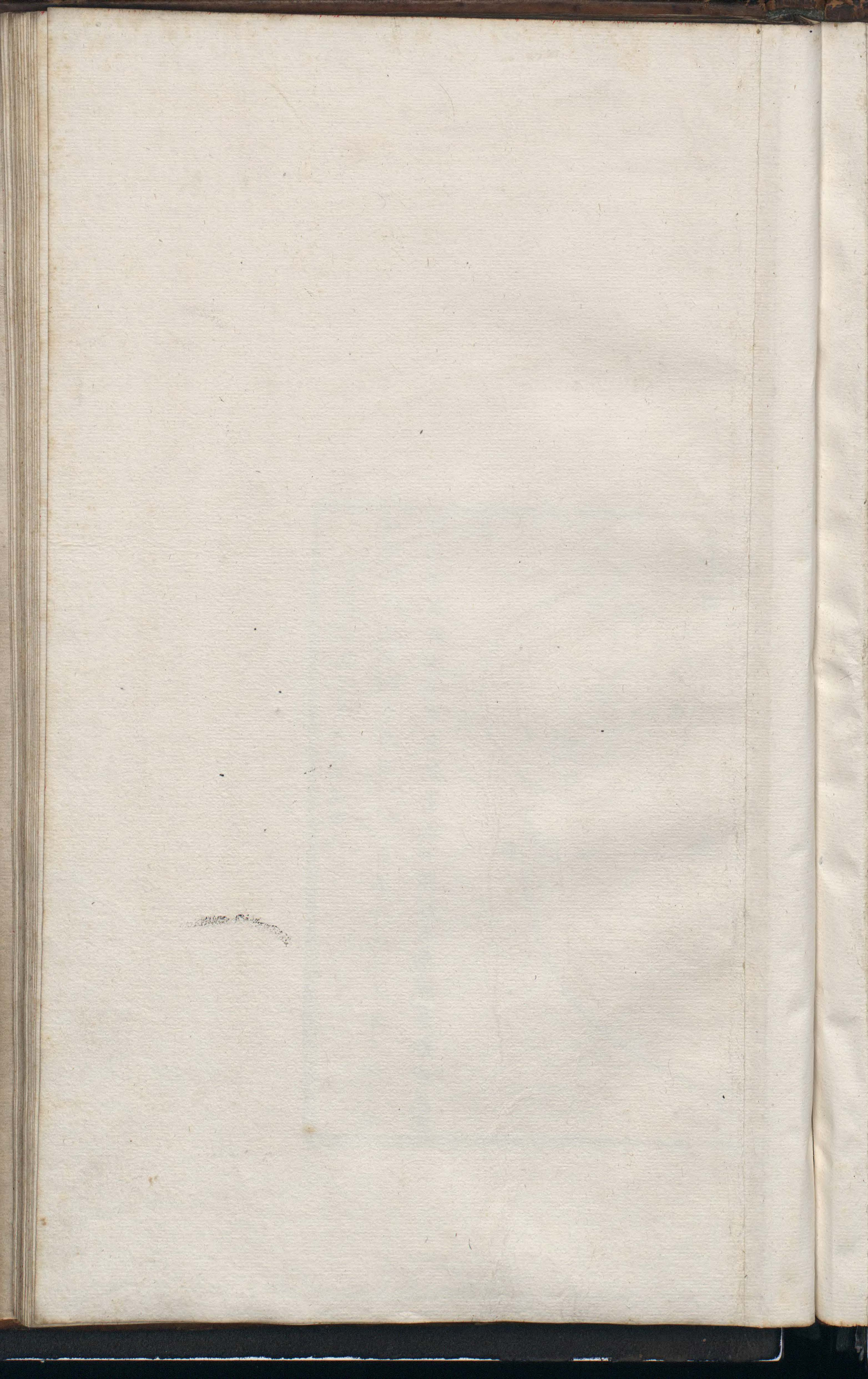


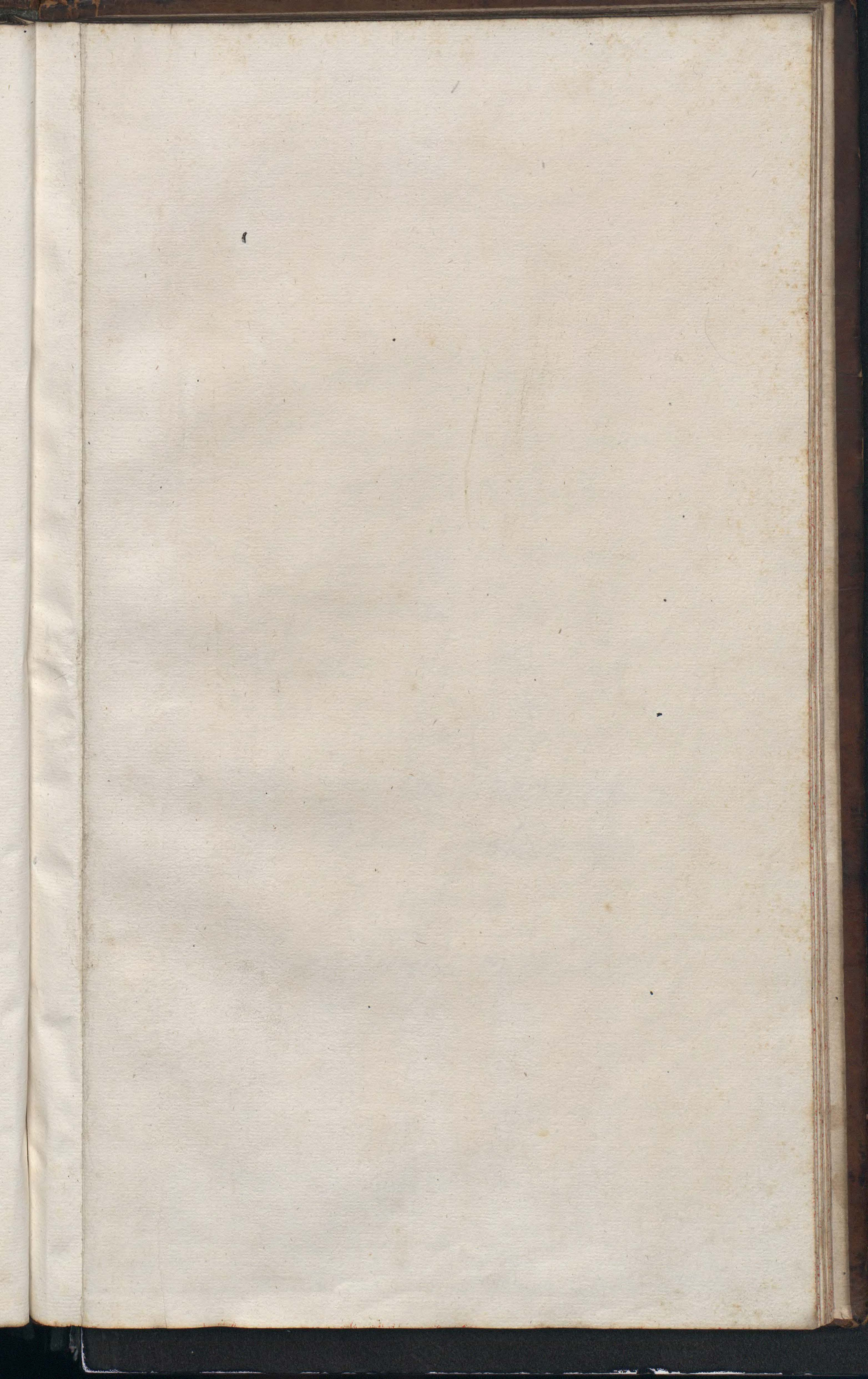


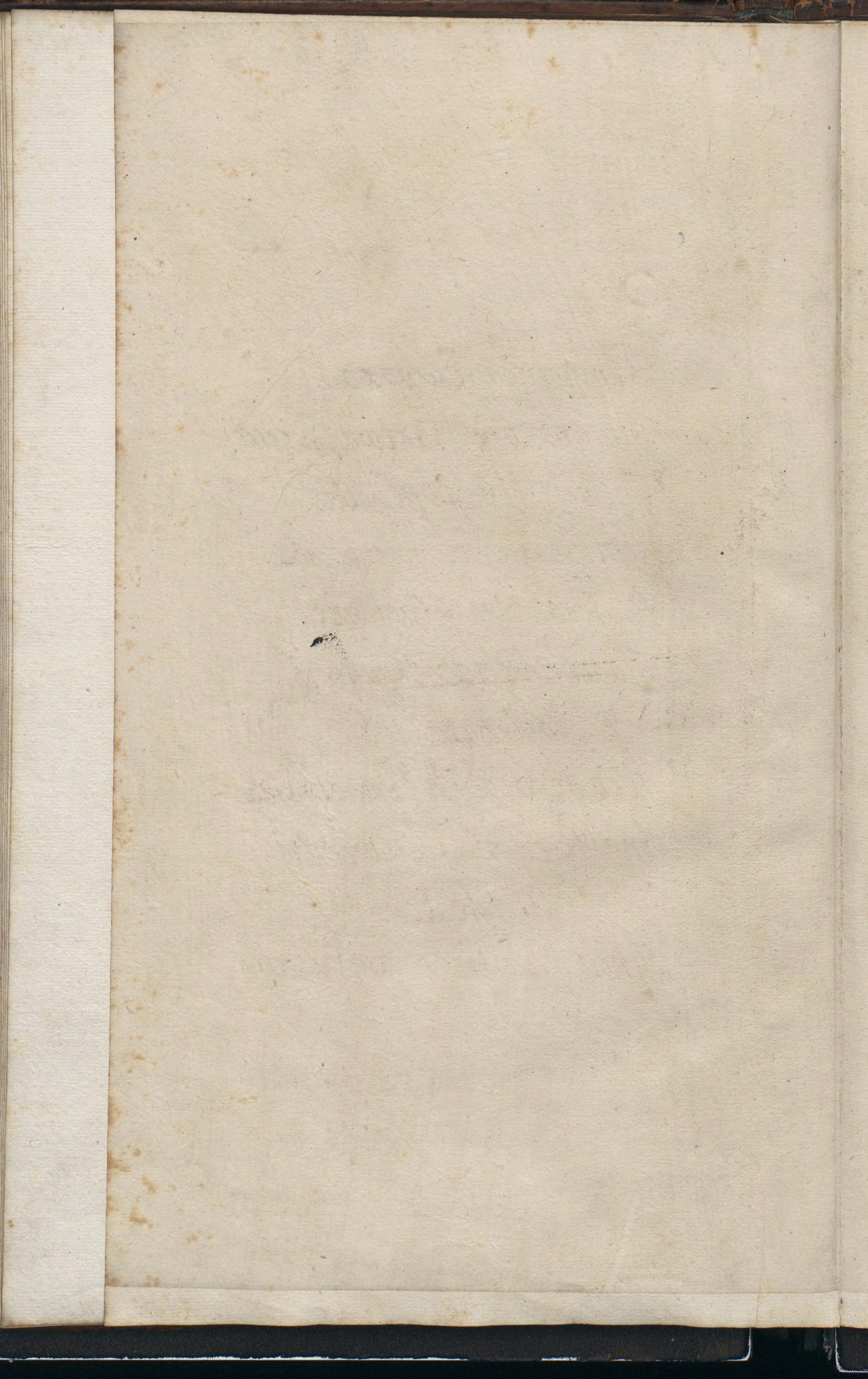


太白伏見之圖其餘四星倣此

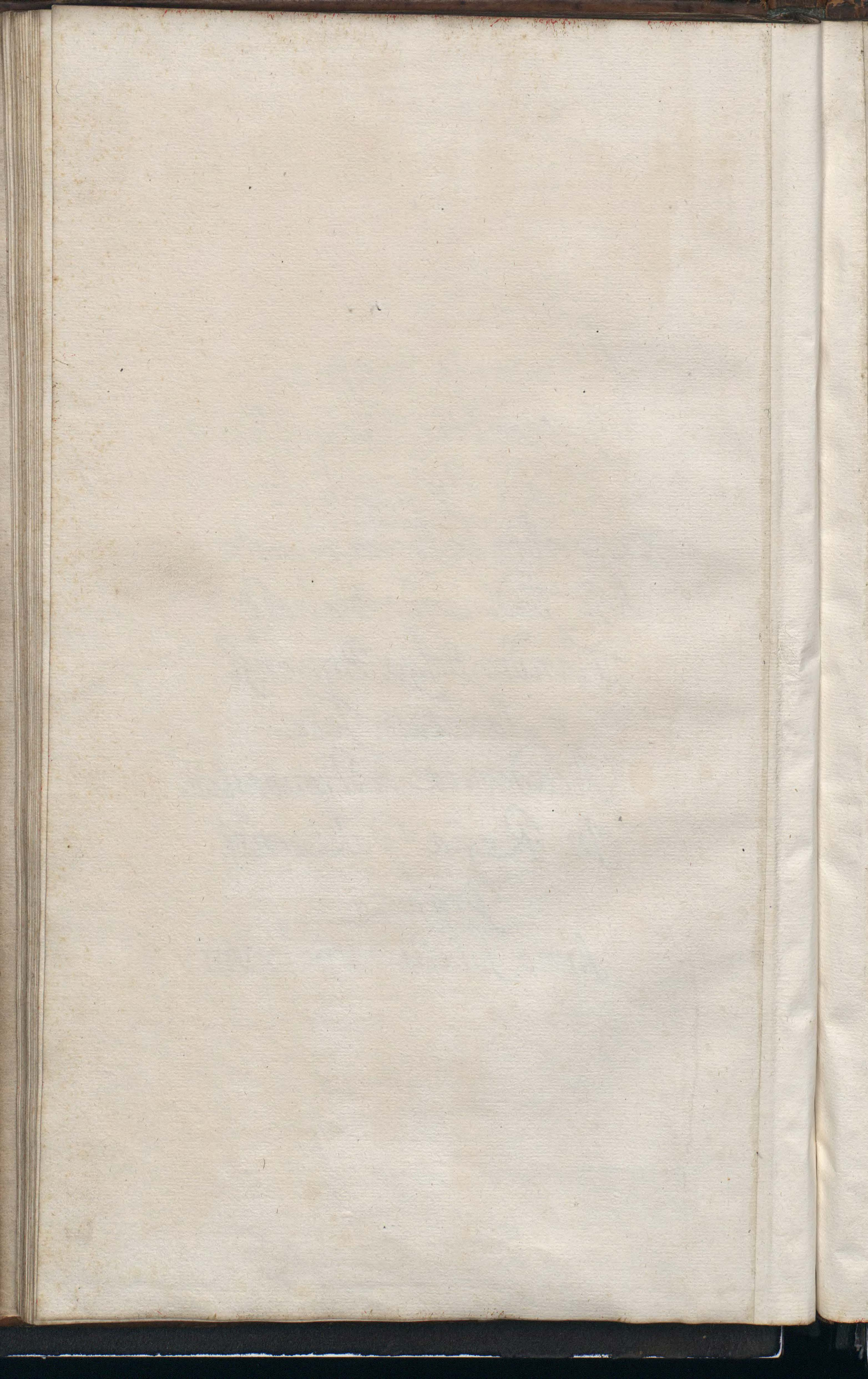
太白在伏見輪。從東而西。即從右而左有本行。約一年零七個月。隨行太陽左右上下。因有朔望上下弦。如太陰然。其餘四星亦然。

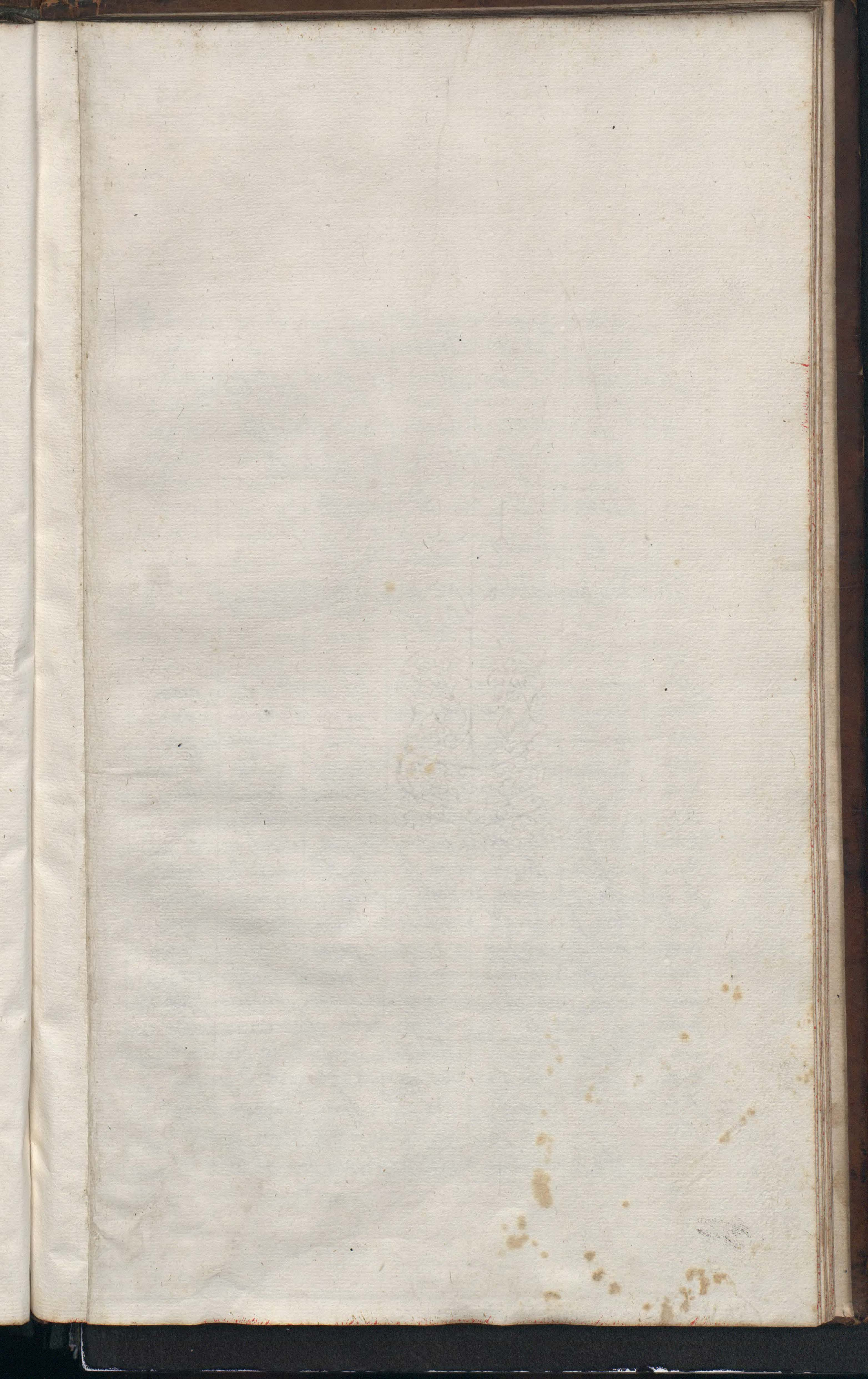






Astronomia Europæa
sub Imperatore Tartaro-Sinico
Cām Hȳ appellato
Ex umbra in lucem revocata
A P. Ferdinando Verbiest
Flandro-Belga Brugensi
E Societate Jesu
Academiæ Astronomicæ
In Regia Pekinensi
Præfecto
Anno Salutis M.DCLXVIII

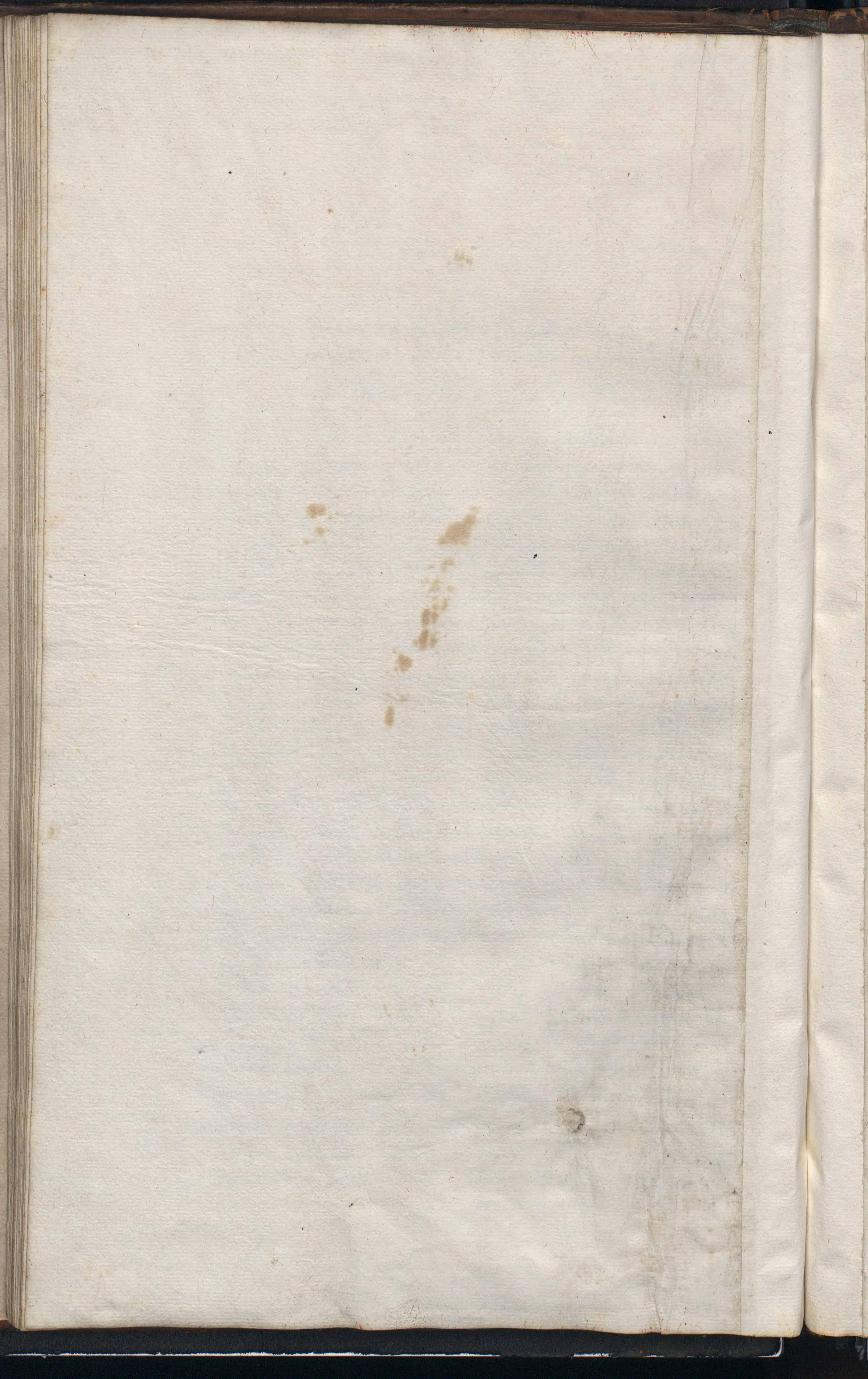


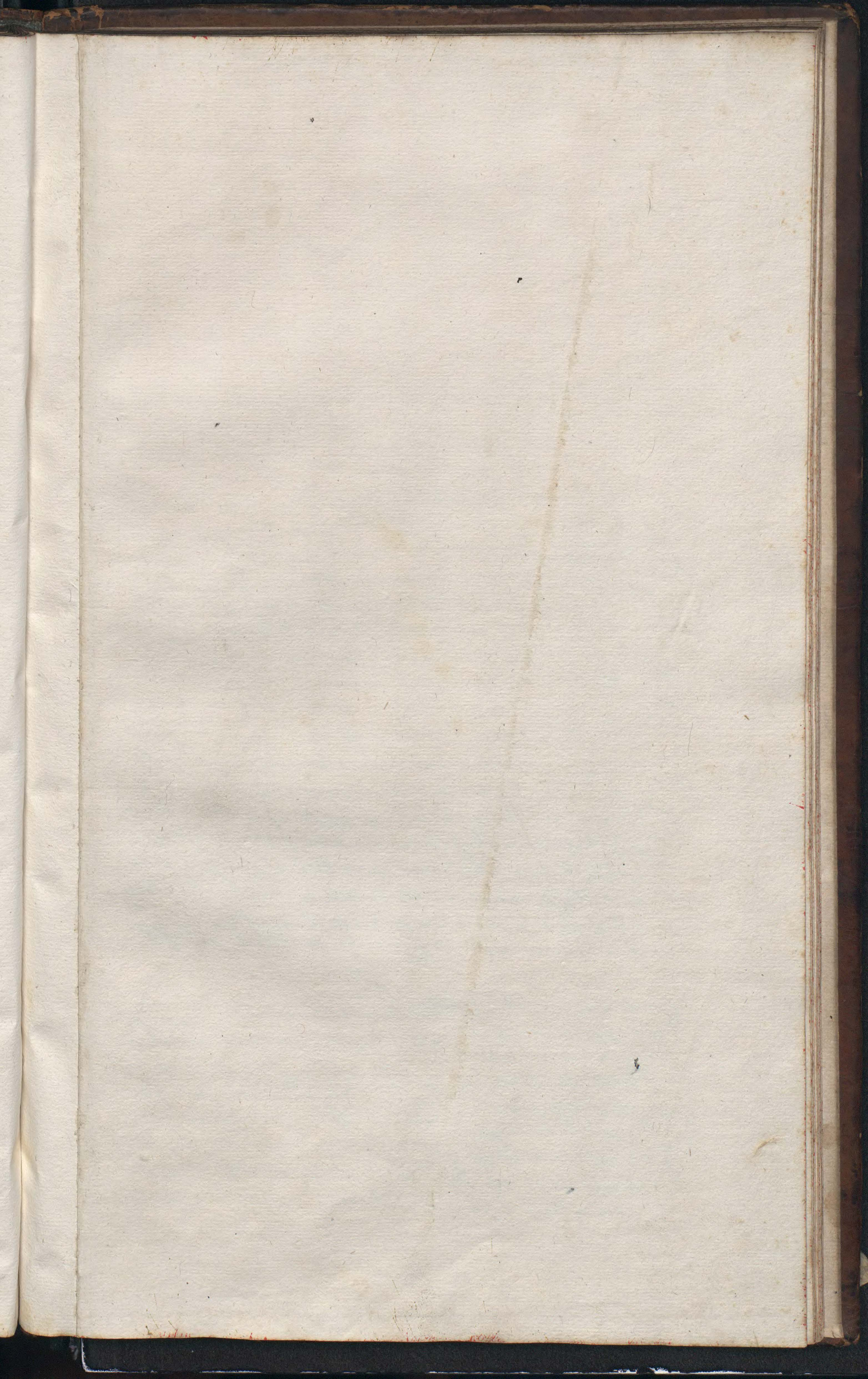


Liber Organicus
Astronomiæ Europææ apud Sinas restitutæ
Sub Imperatore Sino-Tartarico Cam Hy
auctore P. Ferdinando verbiest
Flandro-Belga Brugensi
E Societate Iesu
Academiæ Astronomicæ in Regia Pekinensi
Præfecto.

Postquam ab Imperatore Cam Hy præfectus fui academiæ Astronomicæ Sinarum, quæ jam a quater mille annis et amplius ortus sui spendorem jactabat, Magnates præcipui, qui in specula Astroptica Pekinensi, nostris observationibus jussu Imperatoris interfuerant, dato Libello supplice Imperatori proposuerunt, ut noua instrumenta Astronomica facienda mihi imponeret, quæ scilicet more Europæo affabre facta, et in specula Astroptica Pekinensi collocata, æternam Imperij Tartarici memoriam apud posteritatem seruarent, prioribus instrumentis Sinicis rudioris Mineruæ, quæ jam a trecentis proximè annis speculam occupabant, inde amotis. Imperator statim annuit illorum postulatis, et totius rei curam, publico diplomate mihi imposuit. Ego itaque intra quadriennij spatium sex diversi generis instumenta confeci, 19 circiter millibus Imperialium (ut utar nomine pecuniæ in Europa satis cognitæ) consumptis, ac 16 Libris Sinico idiomate compositis, omnem illorum fabricam, Theoriam et usum, et præterea diversos obseruandi modos explicui; Imo et alia in-

instrumenta, quibus tam terrestri, quam maritimo itinere
uti possimus, etiam addidi. Imperator in varijs Reipublicæ
operibus, non raro Mechanica nostra usus est. Ex: grat:
cum ejus mandato multos ingentis molis lapides ad Regium Mau=
solæum extruendum, quos 500 equi rotis curulibus ægre trahe=
bant, paucorum hominum manu, adhibitis trochleis per pontem
longissimum transvexi. item cum per longam agrorum planiti=
em, aperto novo aquæ-ductu, fontanas aquas ad 8 circiter
stadiorum Sinensium longitudinem, majori libellâ sæpius exa=
minatam, feliciter derivavi. Praeterea cum novo Mechanicæ
artificio, 132 tormenta bellica ex ære fundenda curavi, et sin=
gula currui suo, novâ etiam formâ conferto imposui. Propter
hæc et alia Reipublicæ opera, intermiscui Libris meis, pro=
positiones aliquas fundamentales, ex Mechanica universa de=
sumptas, quibus tum in fabrica instrumentorum, tum in alijs
Reipublicæ operibus usus fueram. Eorum autem omnium fi=
guras, duobus Libris, quos Organicos appello, complexus sum,
additis novâ formâ mappis cosmographicis e cælestibus.
Totum hoc opus Imperatori obtuli, qui illo conspecto pluri=
mum recreatus, statim me præcipui Tribunalis, quod Tai
cham sù appellant, præsidem constituit, id est, supremi
ejus Præsidis titulo donavit; cujusmodi tituli tantum dari
solent ijs, qui magnis in Republica meritis sunt insignes:
Nec multo post, addito novo dignitatis gradu, hos ipsos titulos
ad parentes et avos meos, more Sinico, extendi voluit; quos da
to publicè libello supplice frustra recusare conatus sum.
Hoc autem anno absolvi tabulas Astronomicas expansas sep=
tem planetarum, nec non eclipsium solis et lunæ, quos jussu
Imperatoris ad bis mille annos venturos et ultra extendi, libris 32
impressis, quorum titulus: Astronomia perpetua Imperatoris Cam
Hi. Nunc vero habeo præ manibus Dialecticam et Philoso=
phiam nostram, sub pallio Sinico introducendam, prætextu quidem, Astronomiæ, revera autem ad Religionis nostræ evidenti=
am clarius demonstrandam.





Astronomia Europæa
Sub Imperatore Cām Hȳ
ex umbra in lucem
reuocata.

Sequuntur obseruationes Astronomicæ anno 1668. et anno 1669 habitæ a P. Ferdinando Verbiest Flandro-belga Soctis Jesu, in Specula Astronomica Pequinensi, coram Colais et plurimis ijsque præcipuis totius Aulæ Magnatibus, ab ipso Imperatore Sino-Tartarico, Cām Hi appellato, eo consilio missis, vt testes oculares obseruationibus interessent, quas ubi exactissimè cum calculo suo conuenire demonstratum est, Astronomia Europæa ab inuidia et calumnia Astronomorum Sinensium et Maurorum siue Arabum triumphauit, constituto P. Ferdinando Supremo Academiæ Astronomicæ apud Sinas Præfecto, in concilio Regulorum, Magnatum, et totius Curiæ Pequinensis Mandarinorum, quater hanc vnam ob rem conuocato, ac tandem Religio Christiana, quinto persecutionis suæ anno in publicum iterum prodyt, templis in omnibus fere vastissimi hujus Imperij prouincijs, vti prius apertis.
Nunc breuiter explicabo figuras in fine libri impressas.

Figura 1.a

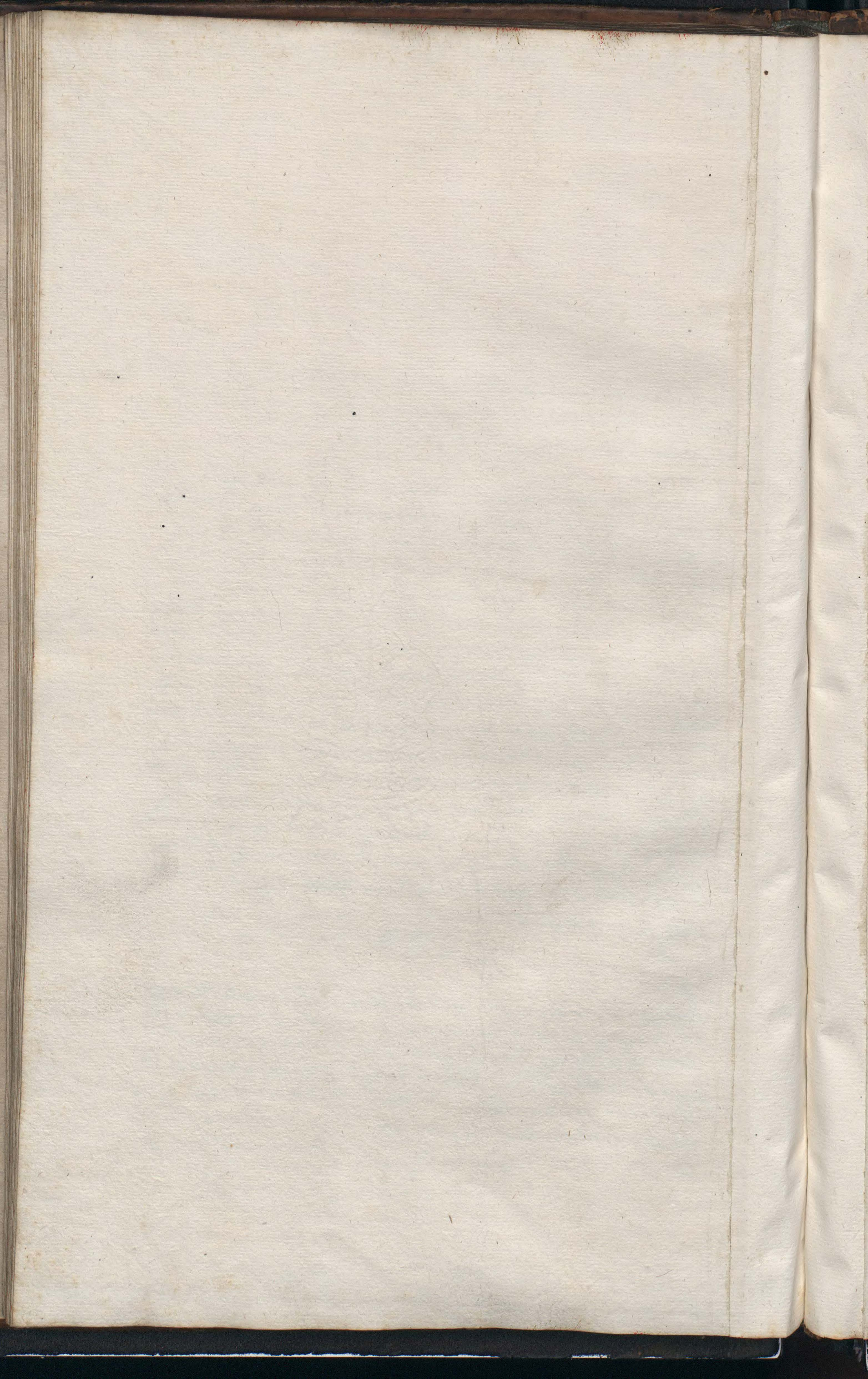
Columna per litteras A.B designata, est ænea quadrilatera, alta 8 pedibus geometricis et amplius, erecta in turre siue Specula Astronomica Pequinensi, ad quam, tamquam stilum, umbras meridianas obseruant in mensa horizontali ænea, longa ped: 18 lata 2, digito vno crassa. Hæc mensa strata est super aliam mensam marmoream, 4 ped. altam, sicut figura eam exhibet.

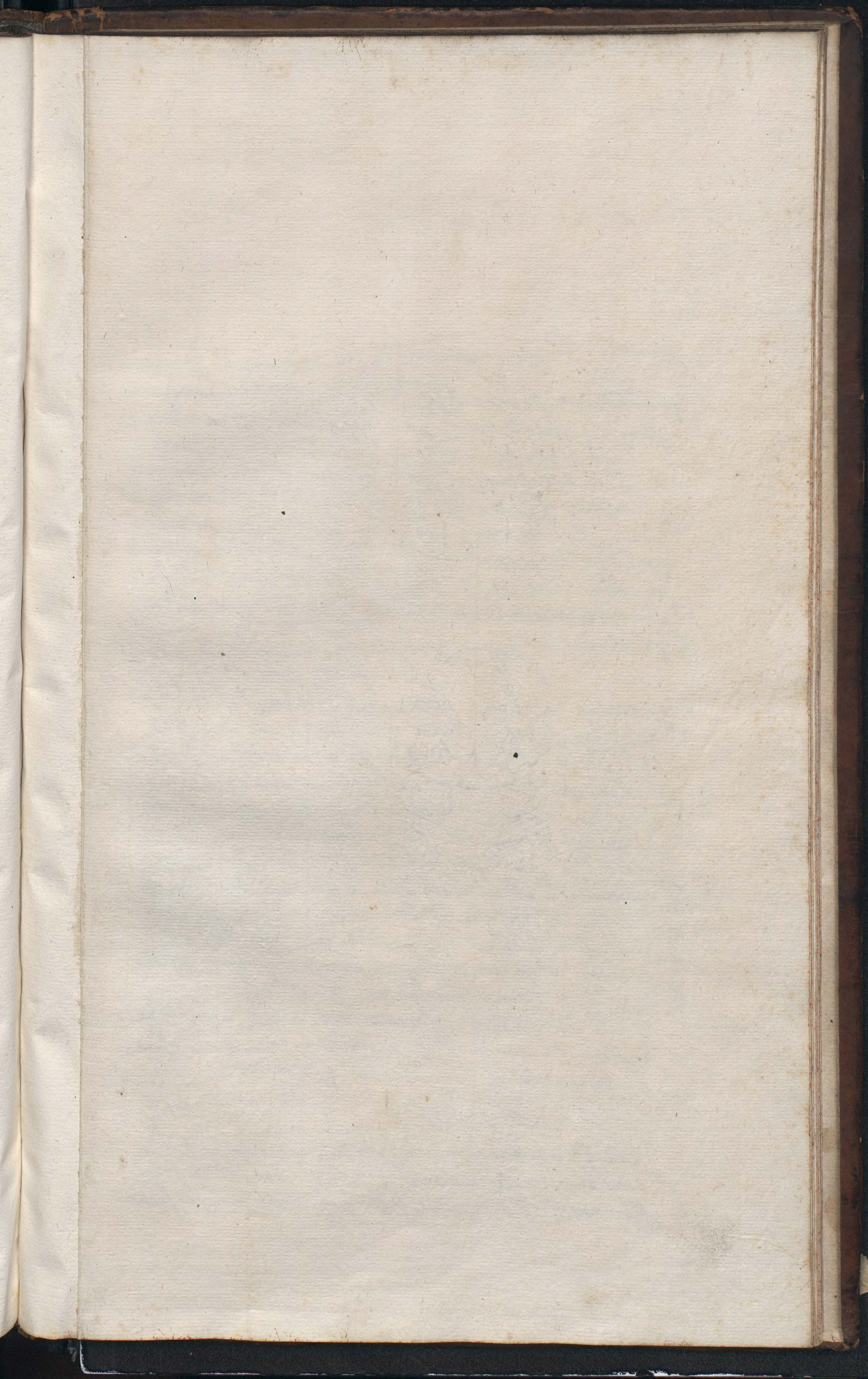
Mensa ænea per medium divisa est in 17 pedes, quos canalis semidigito latis et profundis circumambit, aquâ plenis, ad determinandum situm mensæ horizonti parallelum.

Anno 1668, 27 Decembris mane, Colai et alij Magnates, jussu Imperatoris, reponte vocarunt P. Ferdinandum, et secum duxerunt ad Speculam Astronomicam, ut ad determinatam stili altitudinem, umbram ejus meridianam calculo prædiceret. Itaque ad columnam A.B. adjecto tumultuarie assere (instabat enim hora decima matutina) determinata est stili altitudo 8 pedum, 4 digitorum, et 9 primarum (pes hujus proxime æqualis est Romano antiquo: dividitur in 10 digitos, et singuli digiti in 10 primas particulas, atque hæ singulæ in 10 secundas) Determinata hac stili altitudine P. Ferdinandus mane circa horam 10 facto calculo prædixit umbram ejus in meridie projiciendam esse ad longitudinem 16 pedum, 6 digitorum et præterea 6 primarum (nam sol tunc circa solstitium hybernum longissimas umbras projiciebat) designavitque in mensa horizontali lineam transversam E, tanquam terminum umbræ, et non plus ultra. Ubi vero sol pervenit ad meridiem, ecce præfatus stilus projecit umbram exactissime usque ad lineam E, plane sicut calculus prædixerat.

Figura 2.da

Anno 1668, 27. Decembris post meridiem, Colai et alij magnates postquam Imperatorem de meridianæ observationis successu certiorem fecerant, mox P. Ferdinando indicarunt, mandatum Imperatoris esse, ut die sequenti in ipso palatio Imperatoris ad determinandam novi stili altitudinem, umbræ meridianæ longitudinem prædiceret, calculo, ut supra, facto: Determinarunt autem novi stili altitudinem 2 pedum et 2 digitorum. Itaque P. Ferdinandus dubie calculo [illegible] umbram





projiciendam in meridie, usque ad 4 pedes, 3 digitos, 4 primos, ac 5 secundos. Quare juxta altitudinem stili et umbræ longitudinem jam notam, in tabula horizontali, assere perpendiculariter erecto (quod instrumentum tota nocte intermedia præparaverat) die 28 Decembris ingreditur Palatium, atque in medio ejus coram Colais et magnatibus præfatis, stilo perpendiculariter erecto, ubi sol meridiem attigit, ecce umbra stili exactissimè pervenit ad lineam DE, prout calculus prædixerat, ita ut omnes obstupescerent.

Figura 3ia

Imperator intellecto observationis intra Aulam habitæ felici successu, iterum die sequenti, ad novi stili altitudinem in specula Astroptica determinandam, umbræ ejus meridianæ longitudinem calculo prædicendam, et a Colais ac magnatibus præfatis observandam mandavit. Itaque in specula Astroptica ad columnam æneam (de qua supra in figura 1a) adjecto novo assere, determinata est altitudo stili 8 pedum, 5 digitorum et 5 primorum, ex qua P. Ferdinandus calculo prædixit umbræ longitudinem in meridie diei sequentis projiciendam usque ad 15 pedes, 5 primos et præterea 5 secundas, umbræ termino, per lineam transversam O, in mensa horizontali designato. Die autem sequenti in meridie sol iterum projecit umbram exactissimè usque ad terminum O, sicut calculus prædixerat.

Figura 4a

Hæc figura exhibet armillam zodiaco-æquinoctialem, cujus diameter est 2 pedum et dimidij. Anno 1669 1o die Februarij, P. Ferdinandus, jussu Imperatoris, cum præfectis

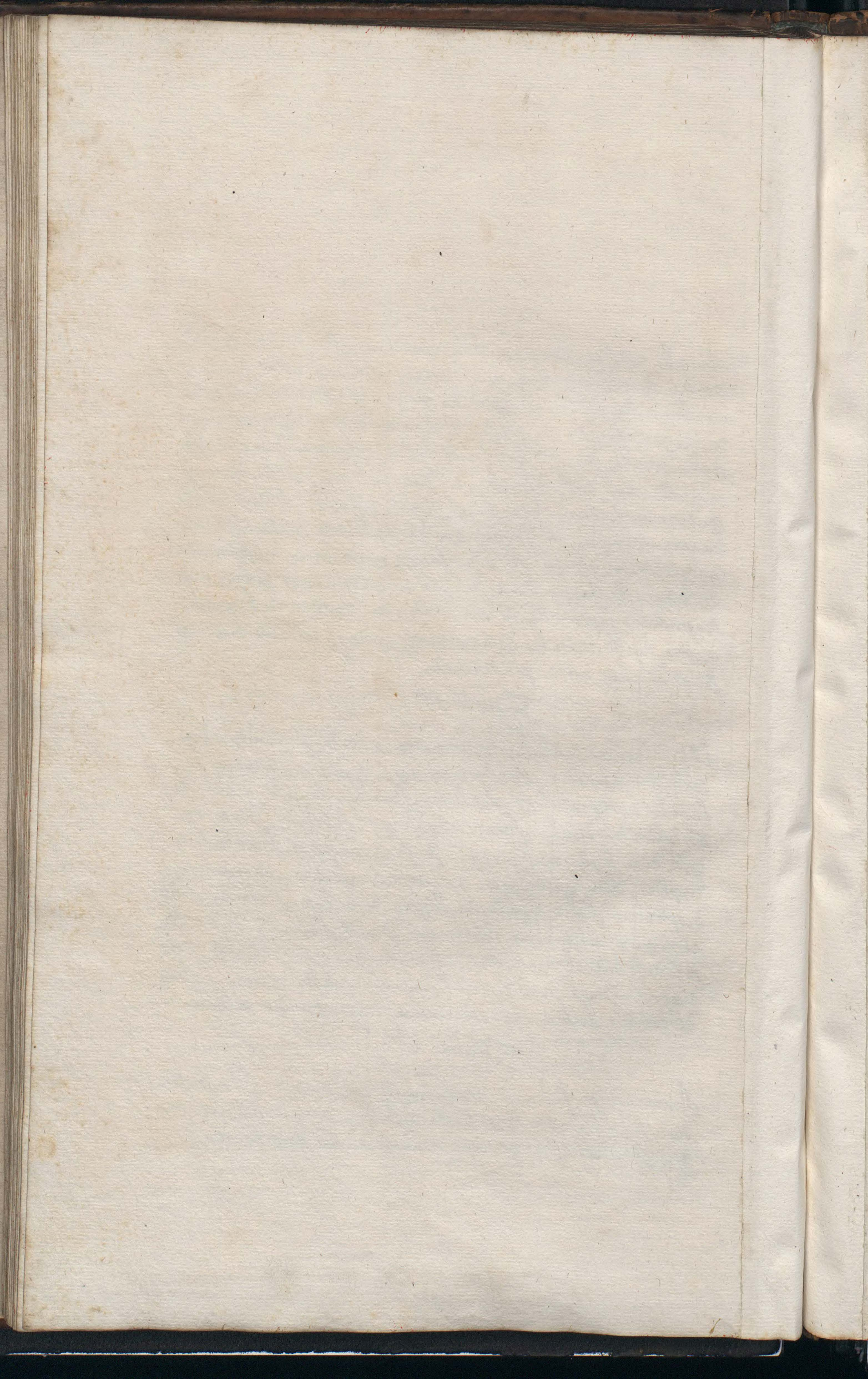
Tribunalis rituum, Speculum Astronomicum ascendit, vt instru=
menta ad observandum praepararet, vbi collocavit hanc
armillam suam, direxitque ad polos et circulos caelestes,
et dioptras fixit in gradu ac minuto illo zodiaci, in quo
Stella Martis die 3.^tia Februarij juxta calculum debebat esse
in distantia determinata a Marchab Pegasi: Et dioptras
quidem in zodiaco jam fixas, sigillo muniuit, Beat. Virgi=
nomine superscripto. Itaque die 3.^tia February noctu, observa=
tus est Mars, etiam ab aduersarys (qui omnibus observati=
onibus jussu Imperatoris semper interverant) et Colais ac
Magnatibus supradictis, in illa distantia a Marchab, quam
dioptra sigillo munita demonstrabat, quamque calculus uno mense
et amplius ante praedixerat.

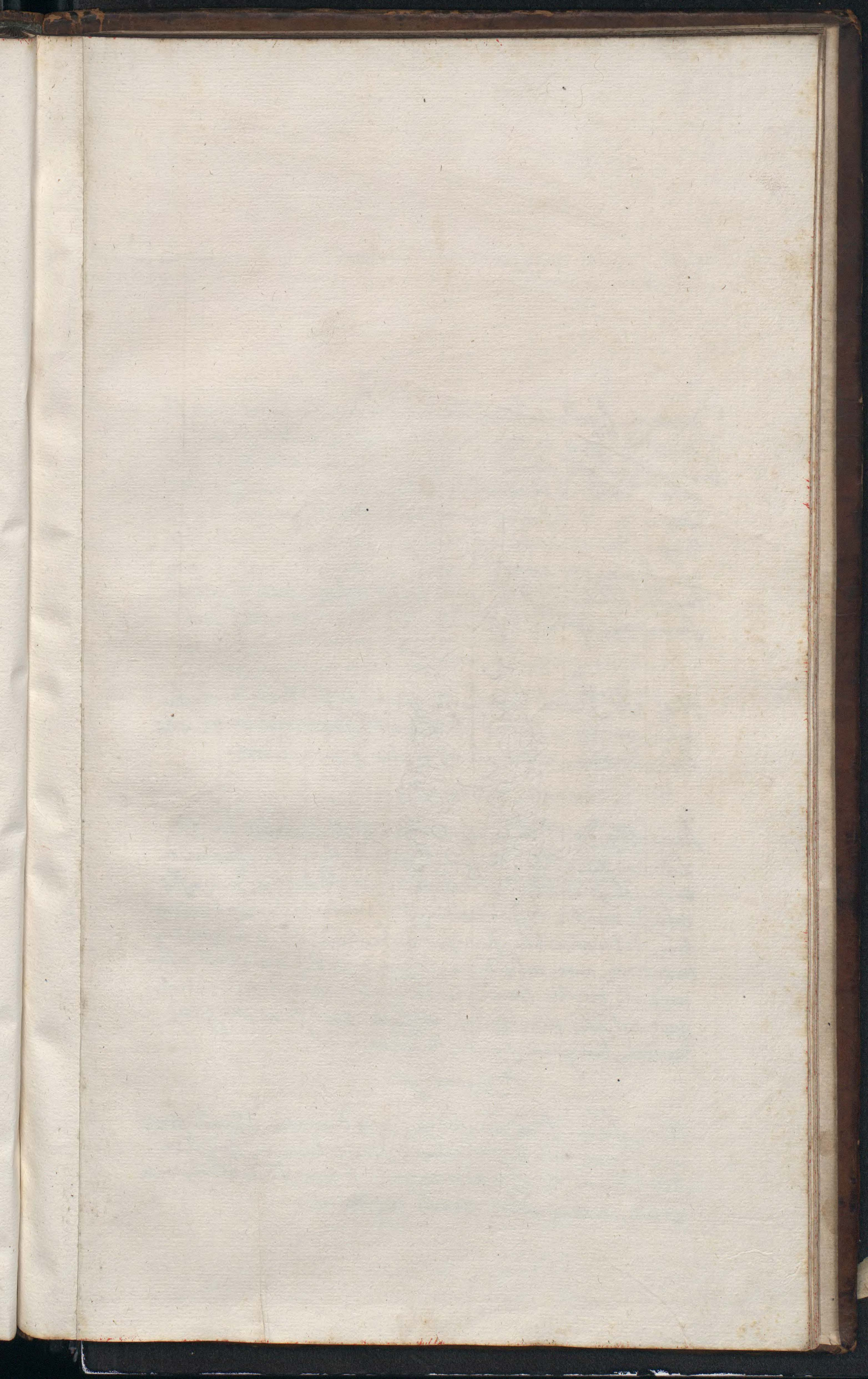
Figura 5.ta

Haec figura exhibet quadrantem aeneum P. Ferdinandi,
cujus semidiameter est 2 pedum et 8 digitorum, erectum in
tabula horizontali, 3 cochleis instructa: singuli gradus in
60 minuta divisi. Anno 1669, die 1.º februarij, juxta ea
quae dixi supra ad figur: 4.^am, P. Ferdinandus in specula As=
tronomica hunc quadrantem direxit ad meridiem, et regulam
dioptralem sacro sigillo, vt supra, munitam fixit in gradu
et minuto altitudinis Solis, quam die 3.^tio februarij in meridie
sol debebat obtinere Pekini, juxta ea, quae calculus prae=
dixerat. Itaque dato die et hora observatio coram Colais
et caeteris habita, exacte iterum respondit cum calculo.

Figura 6.^a

Anno 1669 9.^a february, vt supra, P. Ferdinandus hunc sextan=
tem suum ferreum aeneo limbo vestitum direxit ad caelum.
ejus semidia: est 5 pedum; gradus in 60 minuta divisi.





dioptram sigillo munitam, in minuto declinationis quam Sol die 3.ᵃ February in meridie Pekinensi exigebit, fixit juxta id, quod calculus promittebat, cui observatio eodem die ac horâ coram Colais et magnatibus habita exactissime respondit. Die autem 18 February in meridie, iterum coram Colaijs et magnatibus observata est altitudo Solis in quadrante, de quo figura 5.ᵃ, regulâ dioptrali multis diebus ante fixâ in minuto altitudinis Solis, quam calculus promittebat, qui observationi optime respondit.

Figura 7ᵃ

Hæc est Sphæra armillaris, quam P. Ferdinandus secum tulit, ut coram Colais et magnatibus rationem motus cœlestis, secundum observationes factas demonstraret.

Figura 8ᵃ

Anno 1669, die 18 Februarij, vesperi P. Ferdinandus armillâ Zodiaco-æquatoriâ, de qua supra ad figur. 4., observavit coram Colaijs et alijs distantiam Lunæ ab Arcturo, præmissis calculis exacte respondentem. Observationis hora et minutum determinatum fuit, per distantiam Spicæ Virginis a meridiano ante calculatam, et jam armillâ æquatoriâ observandam, dioptris multis ante diebus in distantiæ minuto, quod calculus promittebat, et sacro Beatissimæ Virginis nomine, tamquam sigillo, munitis.

Figura 9ᵃ

Hunc globum situm astriferum, cujus diameter duorum proxime pedum est, P. Ferdinandus secum tulit in Speculam Astropticam, ut observationes, quas figura 8ᵃ exhibet, coram Colais et Magnatibus clarius explicaret.

Figura 10.a

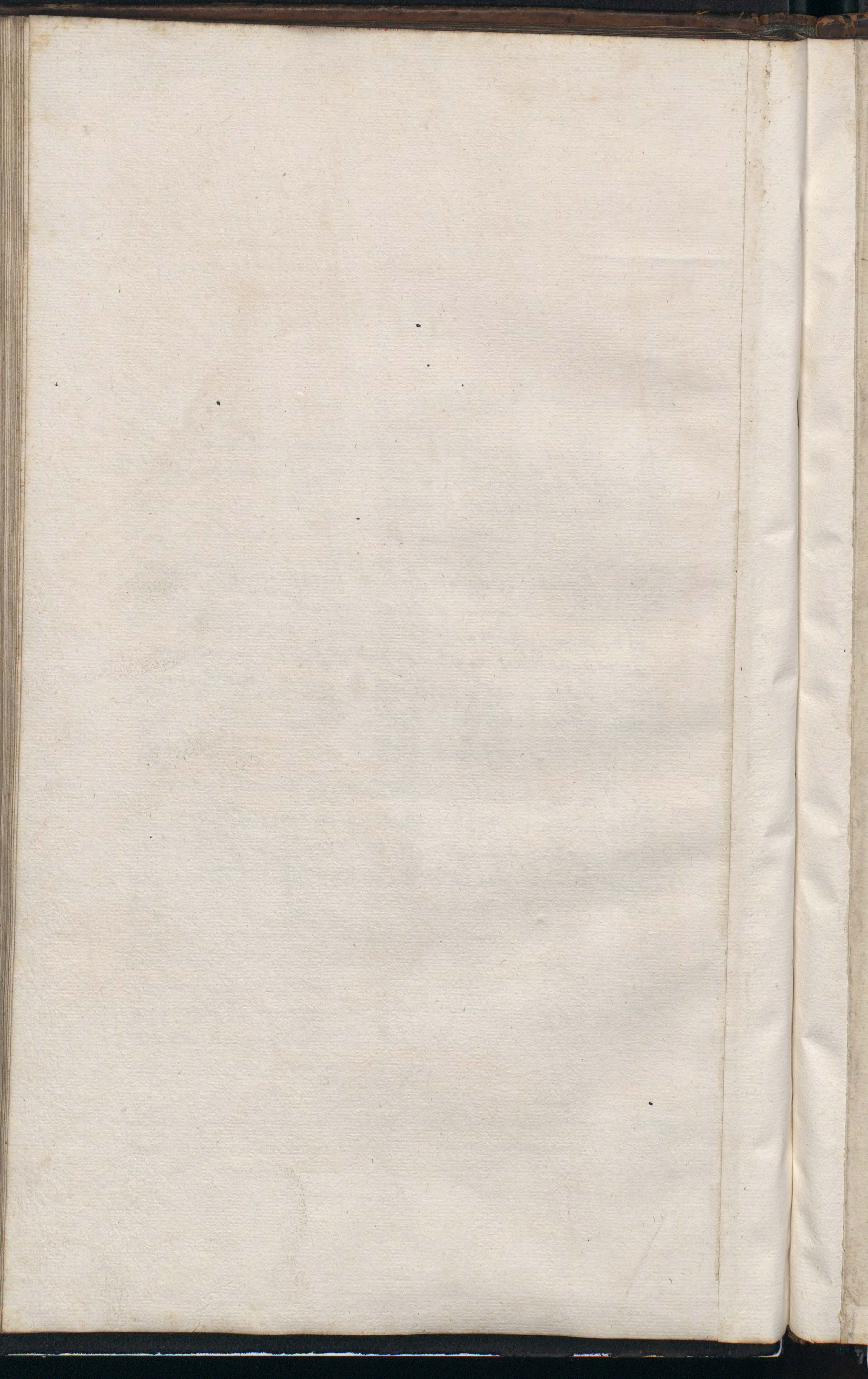
Hæc figura explicat differentiam inter observationes secundum Eclipticam, et inter alias secundum æquatorem factas.

Figura 11.a

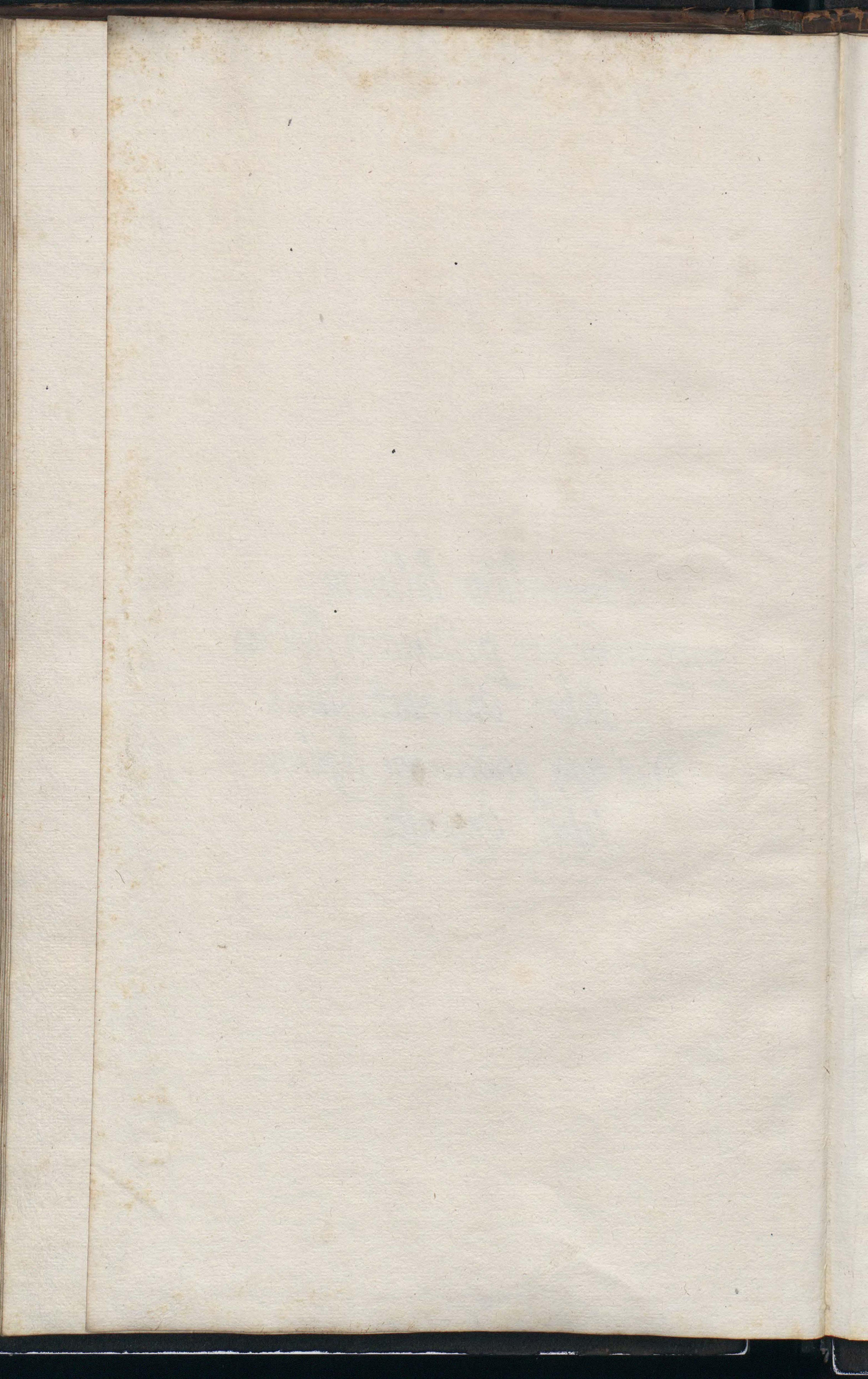
Hæc figura ostendit, stellas Horizonti vicinas, difficulter observari posse; ob refractionem vaporum; cujus rationem P. Ferdinandus coram Colais et Magnatibus explicat, per refractionem nummi in fundo vasis positi, et in aquæ superficie, cum obliquè aspicitur, apparentis.

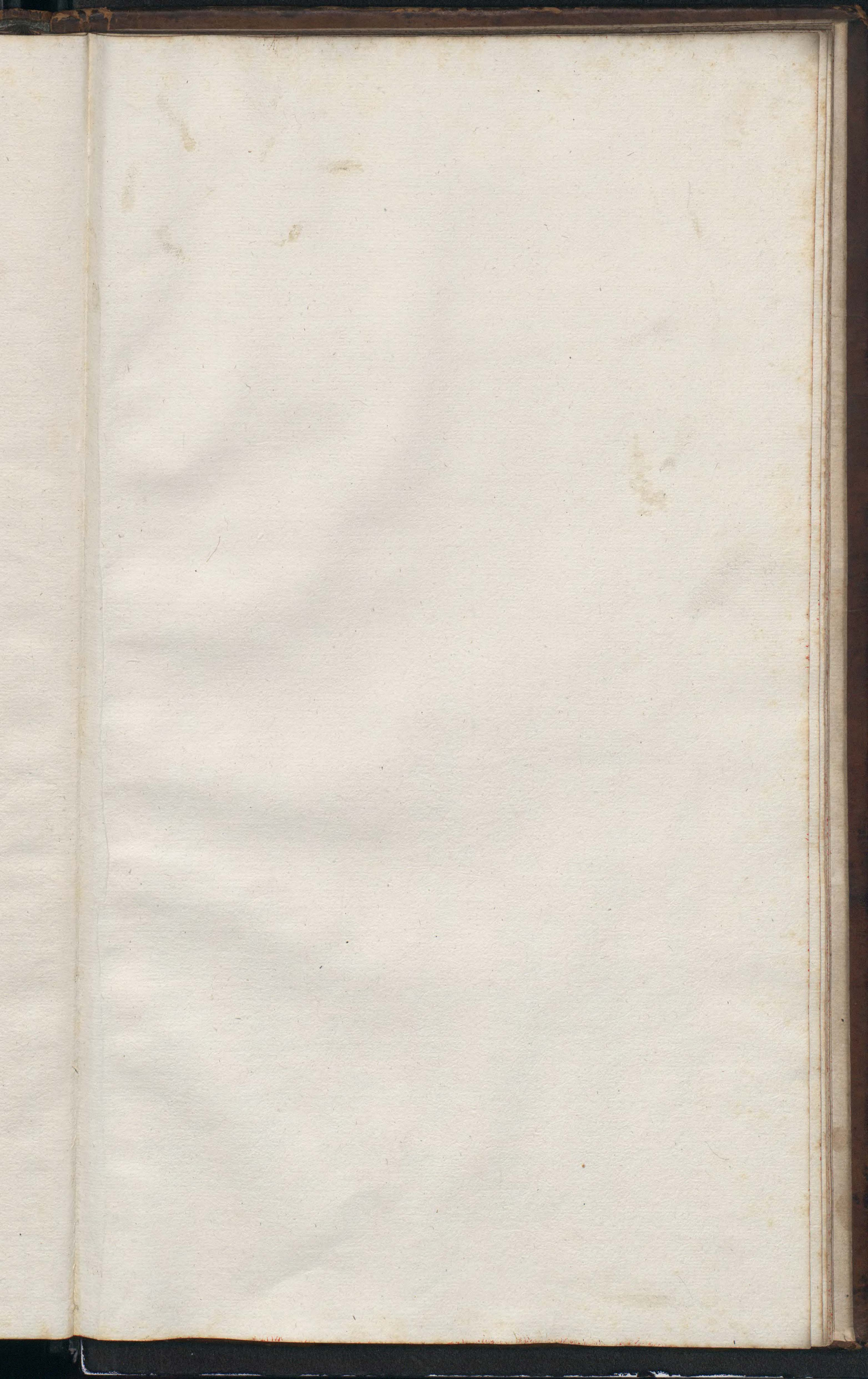
Figura 12.a

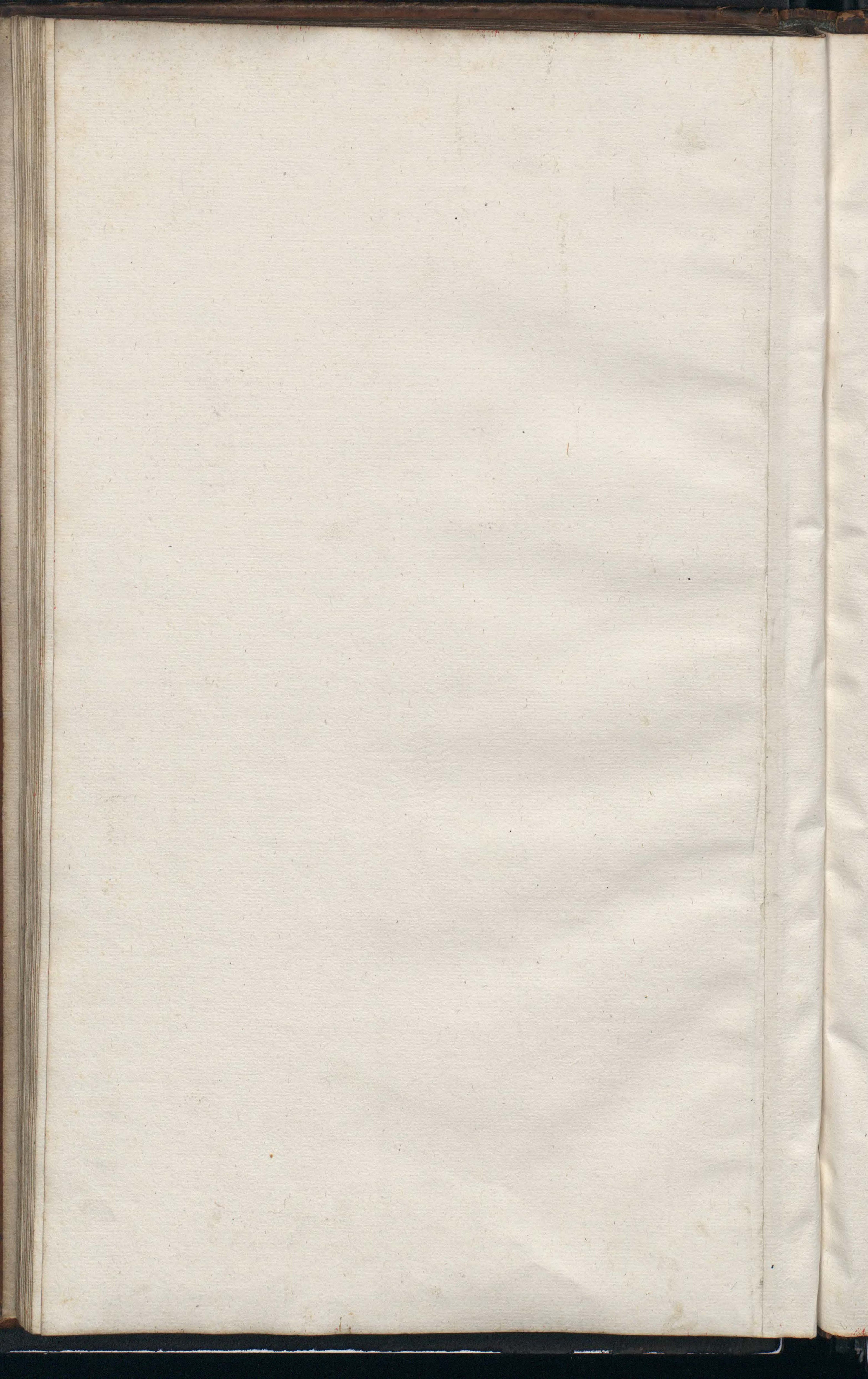
Colais in Speculâ Astropticâ interrogantibus, cur stella Veneris modo vesperi, modo mane, subinde etiam claro die apparere observaretur; P. Ferdinandus hac figura rationem eorum explicabat.

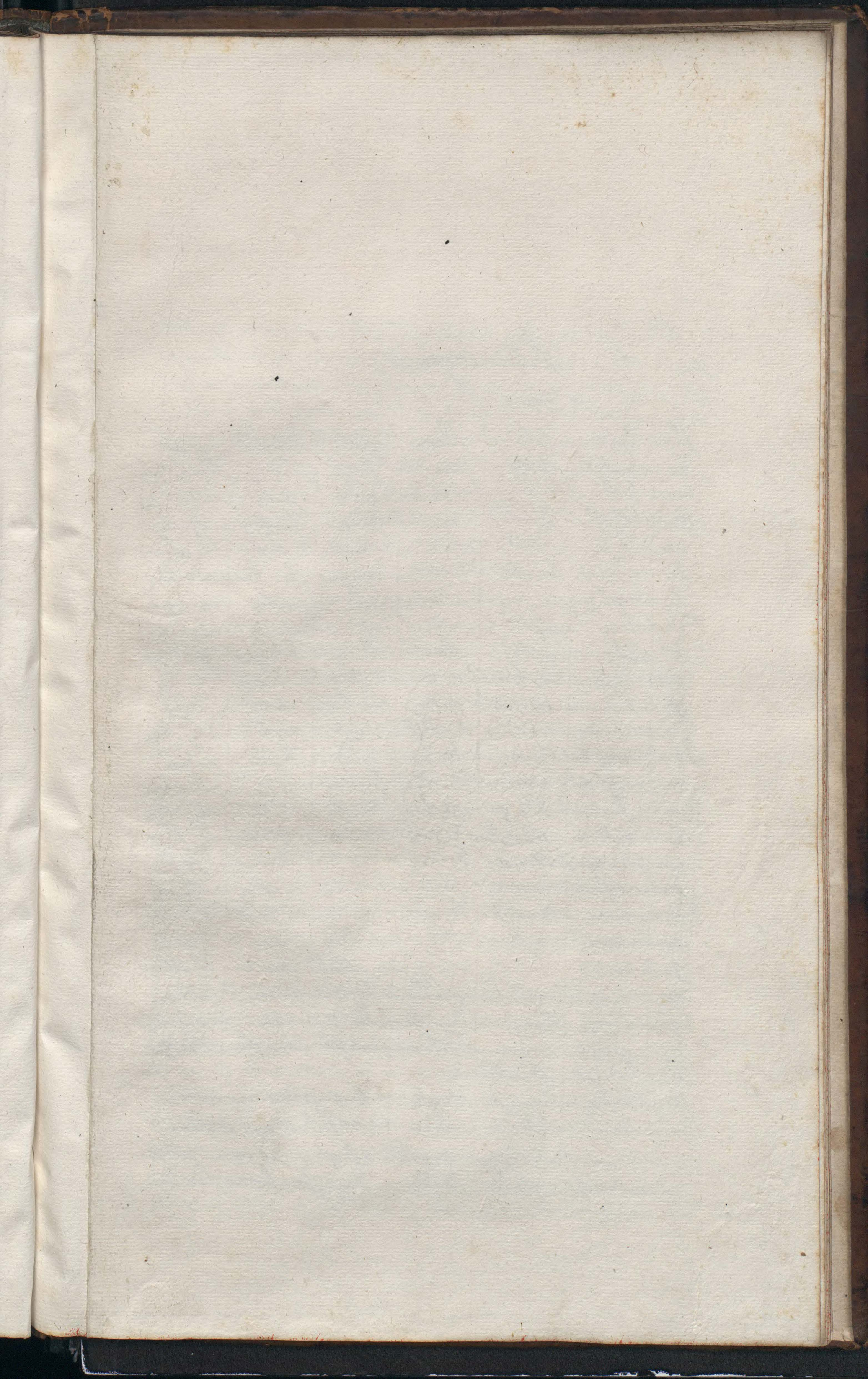


Compendium latinum
proponens XII posteriores figuras
libri Obseruationum
Nec non priores VII figuras
libri Organici









Libri Organici

Figura 1a

Hæc figura exhibet Speculam Astropticam Pekinensem, quæ ad orientalem Urbis plagam sita, formâ quadratâ supra muros Urbis alte eminet, et horizontem longè latèque circumspicit. In hac Speculâ, noua instrumenta Astronomica ita ordine sunt disposita, ut in latere turris australi, globus cœli astrifer, medium locum obtineat, utrinque vero binæ armillæ, Æquatoria, inquam, angulum orientalem, Zodiacalis autem occidentalem occupet. In medio lateris occidentalis horizon cum triangulo azimuthali collocatus, ad cujus dexteram quadrans volubilis, angulum borealem occupat. In medio lateris borealis, sextans in omnem cœli partem versatilis eminet; ad cujus dexteram, anemodicticum in altissimâ arbore erectum est: In medio denique lateris orientalis, turris quadrata, supra planitiem majoris speculæ erecta est, in cujus quatuor angulis, singuli mandarini sunt dispositi, qui distributis inter se horis, die noctuque vigilanti oculo in cœlum sunt intenti, et quæcunque spectant ad aëris aut cœli vicissitudinem, ad meteora, ac cœli phænomena, diligenter observant, nec non in libro determinato annotant, ac singulis diebus mane, ad Præfectum Astronomiæ, particulari scripto deferunt, nomine et chirographo eorum, qui statis horis observarunt, adjunctis. In medio illius turriculæ, focus figurâ rotundâ excavatus, ad carbones tempore hyberno accendendos, ac frigus arcendum. Ad sinistram ejusdem turris supra communem totius turris planitiem, est domus erecta, in quam mandarini vigiles se recipiunt, ut contra pluviam vel similes cœli injurias se defendant.

Præfata sex instrumenta Astroptica habent gradus marmoreos, in formam amphitheatri circum erectos, ut scilicet, cum 10 pedum altitudinem facile adæquent, oculus astropticus, ad omnem eorum partem se possit applicare. Ad radicem hujus speculæ amplum tri=

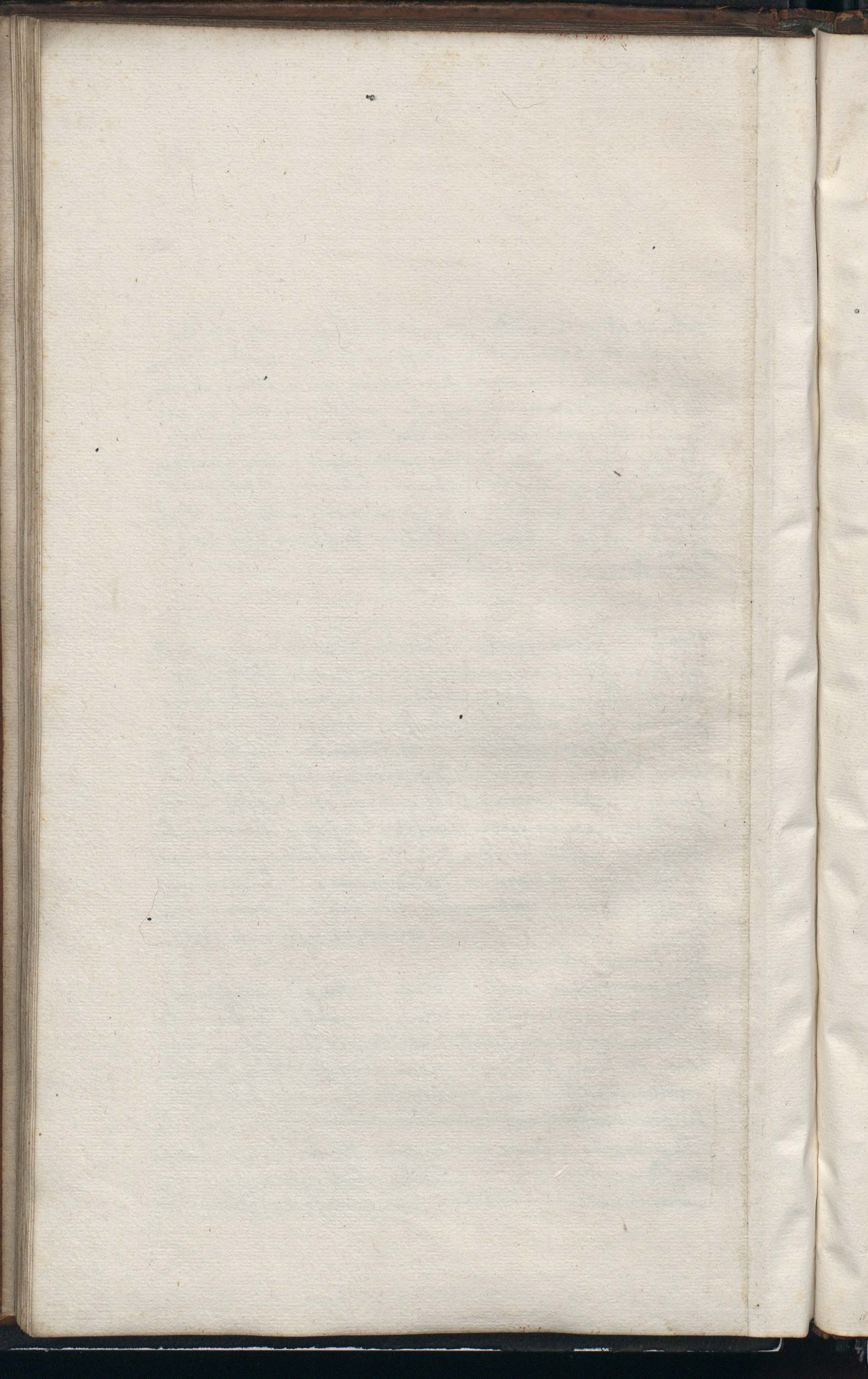
2

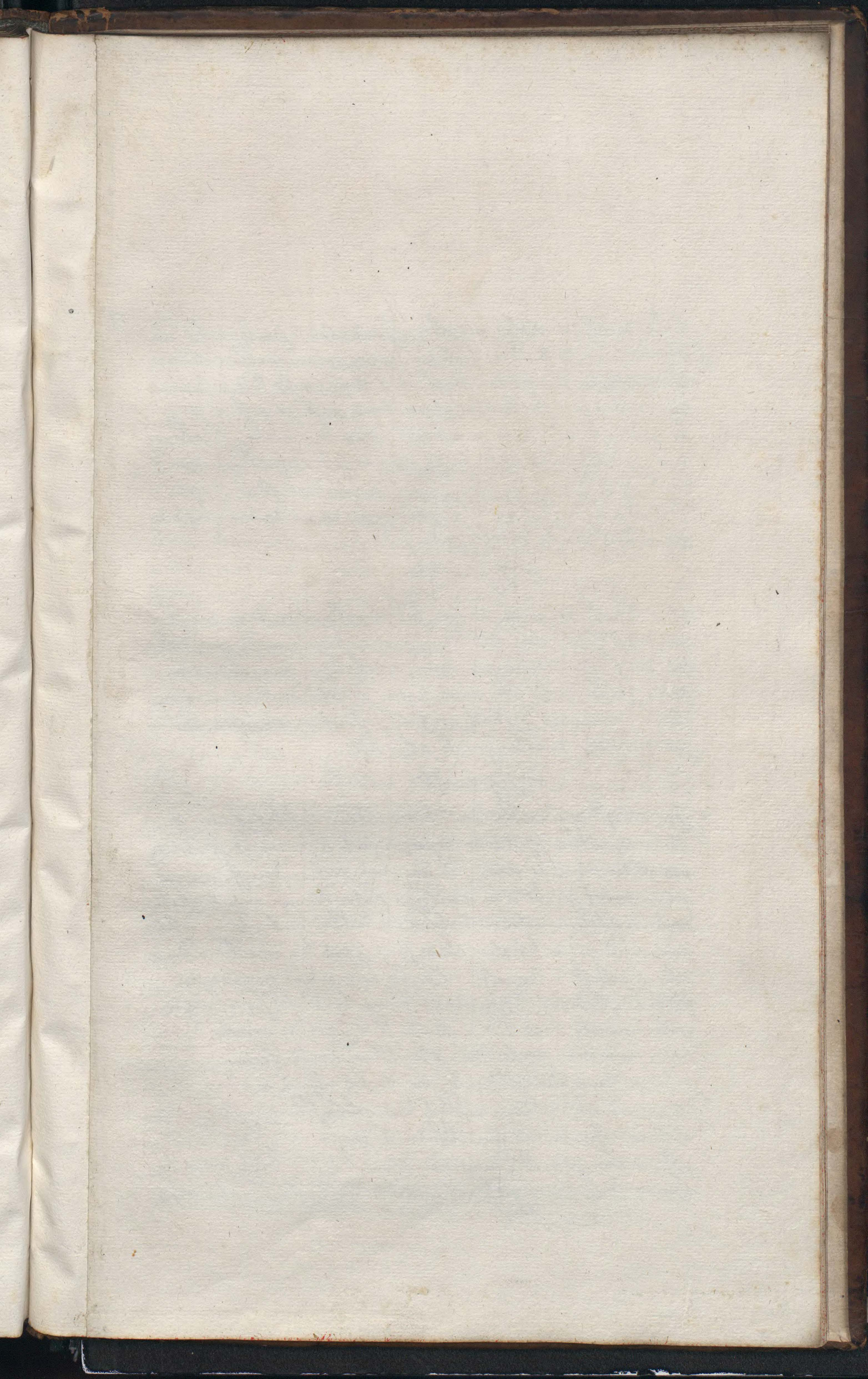
Tribunal est erectum, multis ædificiis, atrium oblongum cingentibus, in quibus et clepsydra antiqua, et præterea stilus æneus ad 8 et amplius pedum altitudinem erectus, supra mensam pariter æneam, 15 pedibus longam, et digito uno crassam; in hac quotidie solis umbram meridianam distinguunt. Vide Libellum meum Observationum figurâ 1a. Ad hoc tribunal, et ad hanc speculam quotidie mittuntur 20 et amplius Mandarini vigiles, ex maiori totius Astronomiæ tribunali, quod non procul distat a Palatio Imperatoris, et in quo 160 modo sunt Mandarini, et subinde 200, diversi ordinis et gradus, qui Præfectum suum statis diebus Astronomica etc. explicantem audiunt.

Figura 2da.

Hæc figura proponit armillam zodiacalem draconibus innixam, qui et ipsi pedestali (ut termino architectis usitato utar) trabibus æneis in crucem obliquam decussatis innituntur. dracones, prout Sinæ illos depingunt, toto corpore nubium globis sive spiris intorti, et effuso circa cornua capillitio, mento barbato, atque ore flammivomo terribiles. Hanc autem draconum et pedestalis, sive trabium oblique decussarum formam, eo consilio cæteris prætuli, quia, cum dracones sint corpore gracili et in omnem partem flexibili; hæc forma ad dexteram levamque non multum excurrit, sicut alia pedestalia quadrata aut rotunda solent excurrere, et ideo ad omnes instrumenti circulos facilem observatori aperit accessum. Præterea cum dracones antiqua sint insignia Regis Sinarum, decebat, ut instrumenta Regia suos dracones ostentarent.

Diameter maximi circuli totius armillæ sex pedes geometricos adæquat, adeo ut armilla pedestali suo imposita, 10 pedum altitudinem excedat. Quatuor leunculi ex ære item fuso confecti, totam machinam sustinent, in quorum tergo singulorum singulæ cochleæ sive vites æneæ maiores extant, quarum subsidio trabes æneæ decussatæ, atque adeo totum instrumentum facile attolli et deprimi; atque in omnem partem potest librari, ut scilicet circuli armillares circulis cælestibus possint respondere. Vites autem maiores singulæ habent suum, quo teguntur pileum, tra-





trabi decussatae vitibus minoribus affixum: cujus jam aperti formam videre licet ad sinistram figurae. Omnes autem armillae circuli ita sunt inter se connexi, atque axes eorum polis suis inserti, ut cochleis suis facile solvi, atque iterum conjungi possint: Atque hi quidem circuli, tam in convexâ, quam in concavâ suâ curvaturâ, in 360 gradus, et hi in 60 minuta prima, per lineas transversales, ac denique minuta prima in quindena secunda, per pinnacidia dioptrica dividuntur; quae etiam de reliquis instrumentis divisis intelligenda sunt.

Figura 3ia

Haec figura draconem unum, sub armilla aequatoria, hianti ore, quasi fatiscentem exhibet. Caeterum haec armilla, quoad altitudinem, circulorum diametrum, pedestalis formam, et caetera omnia, plane similis est priori. tantum adverto, declinationis circulum, ex incuria pictoris, non satis distinctum exhiberi, sed sub meridiano circulo quasi abscondi.

Figura 4a

Figura 4ta azimuthalem horizontem exhibet, quem 4 dracones, nubium spiris toto corpore intorti sustinent, et ipsos dracones quidem trabes aeneae, ad angulum rectum decussatae, aeneas autem trabes 4 cubi item aenei (quos pictor hic non expressit) sustinent cochleis in extremo trabium existentibus, quibus totum instrumentum, ad nutum libratur; plane sicut supra de armillae zodiacalis pedestali dictum est. Circuli horizontalis diameter sex pedum longitudinem adaequat, et plana limbi ejus superficies in gradus, minuta 1a et 2da divisa est, sicut supra de armillis dictum. Axem verticalem tenue filum, intra tubum aeneum utrinque apertum exhibet; Quod filum verticale, cum duobus aliis in extremo alhidadae concurrentibus, binum exhibet triangulum filare, quod ad ipsam alhidadam affixum, una cum alhidada in omnem caeli plagam facile possit circumagi, duobus duntaxat draconibus, hinc inde polum horizontis, flammivomo globo inter nubes aeneas fixum continentibus

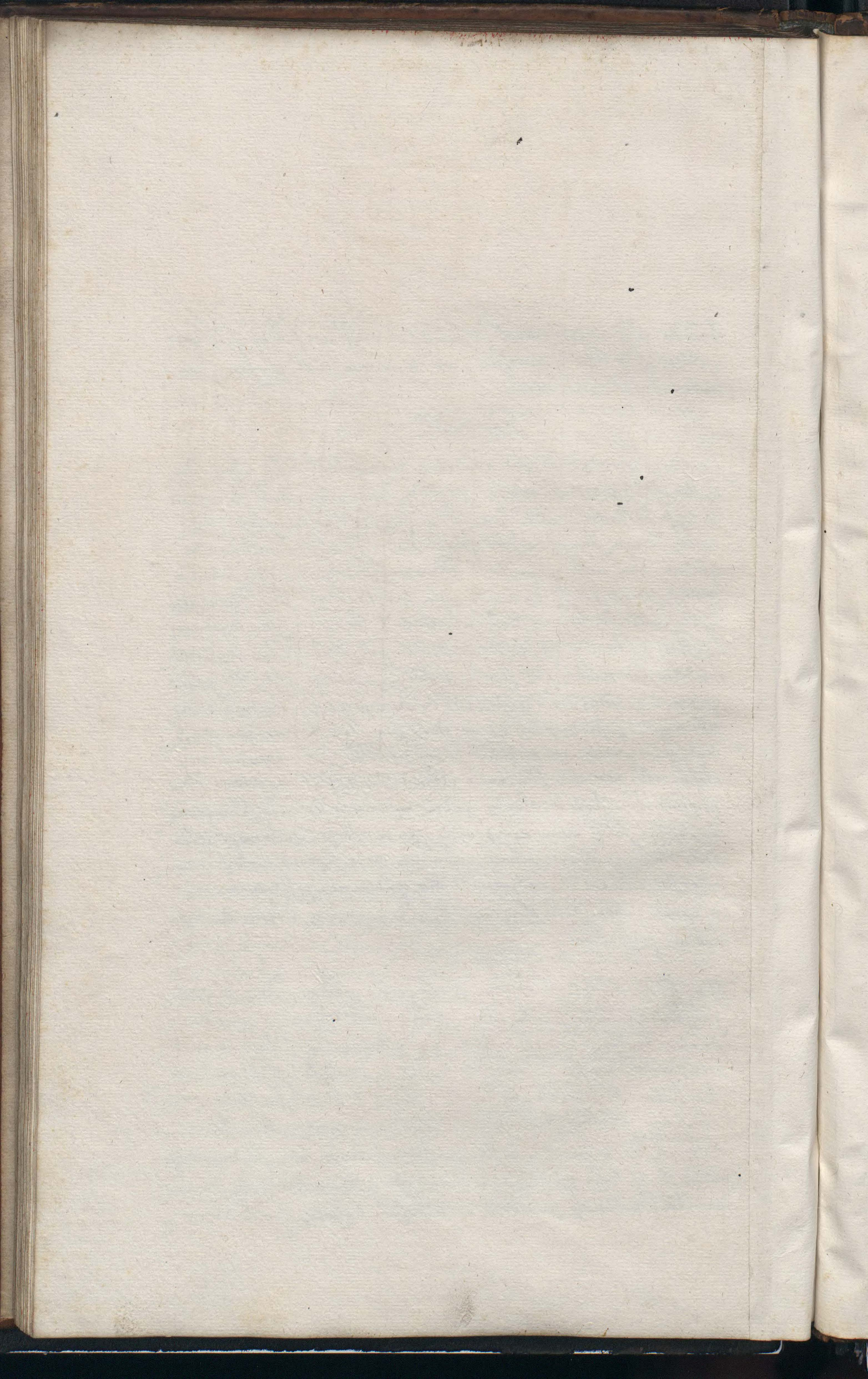
Quodvis aliud ornamentum de industria omissi, ne scilicet quid apponeretur, quod liberum accessum, aut in omnem coeli plagam speculantem oculum impediret.

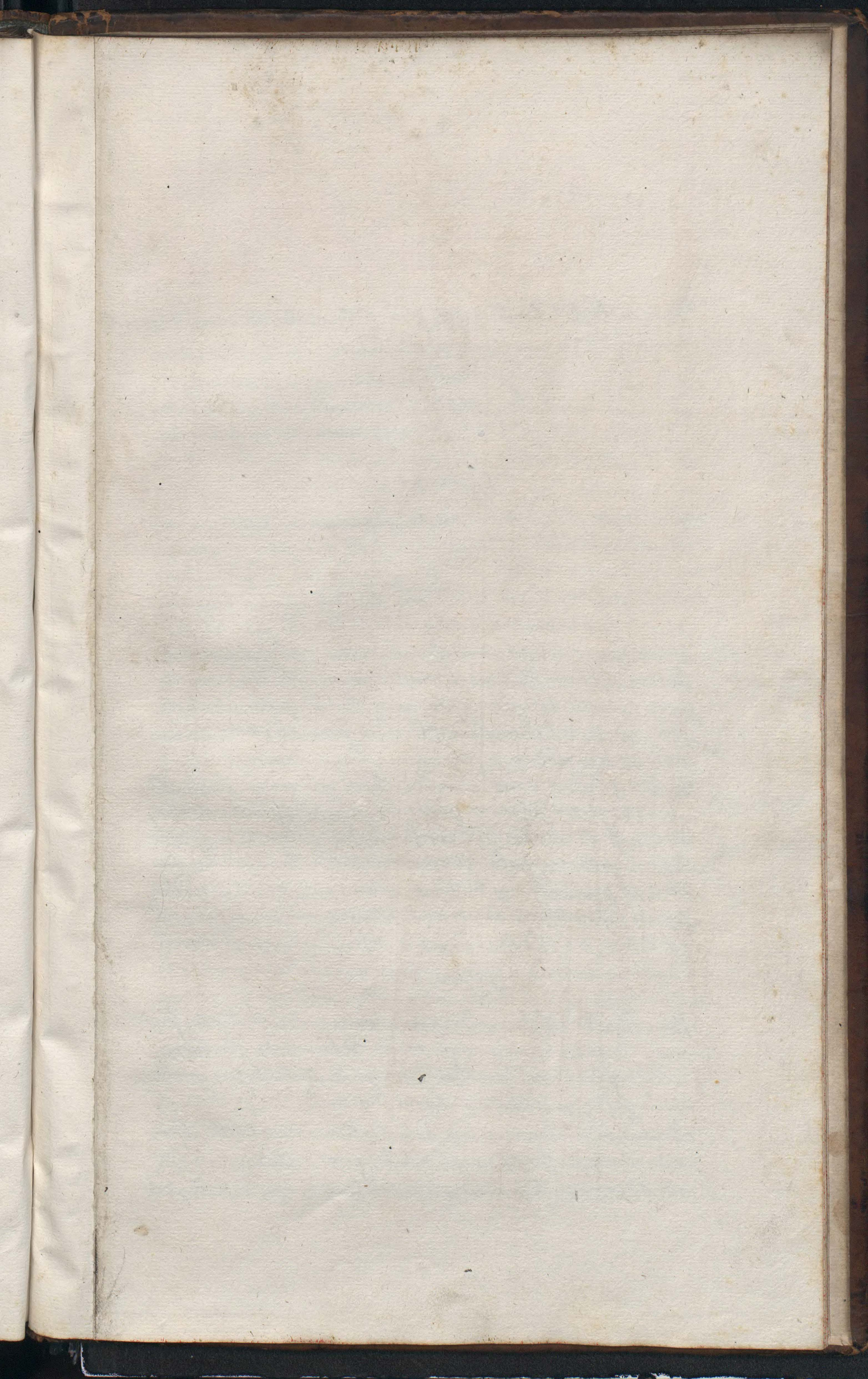
Figura 5.ta

Sequitur figura 5.ta, id est quadrans magnus volubilis, cujus radius sex item pedes geometricos adaequat, plana autem limbi superficies usque ad dena minuta secunda divisa est. Mediam quadrantis aream, draco sinuosi corporis flexu ita occupat, ut instrumento quidem non multum ponderis addat, nilibus vero aeneis toto corpore circumspersis annexisque, ita latera bina quadrantis cum curvatura limbi continet, ut non sinat aberrare a plano ejusdem verticalis. Axis columnae aeneae chalybeo capite in polo item chalybeo ita circumvertitur, ut cochleis suis facile constringi, laxarique possit; Et ad Nadir quidem tres vites ita dispositae, ut in omnem partem axis quadrantis nullo negotio possit impelli, donec exactissime axi horizontis respondeat; quod quidem ex perpendiculo axi parallelo (quod aeneo tubo inclusum est, ne aëri fluctuanti colludat) manifeste arguitur. Hoc perpendiculum, sicut et aliorum instrumentorum est tenue filum aeneum, ejusque globus item aeneus, cujus pondus est unius et amplius librae. Totum quadrantem binae columnae aeneae superne ac inferne inter se connexae ita continent ut ille quidem non possit tremere, in omnem autem coeli plagam, absque impedimento, liberum undique habeat prospectum.

Figura 6ta

Hoc figura exhibet sextantem aeneum, cujus quidem radius 6 pedes geometricos excedit, singuli autem gradus limbi usque ad 15 minuta secunda dividuntur. Innititur autem hoc instrumentum fulcro in omnem partem versatili, adeo ut a situ horizontali usque ad verticalem sursum ac deorsum, recte et oblique possit attolli, et in omnem coeli circulum possit dirigi ac cochlea firmari, in omne latus inclinando illud, et reclinando, ad libitum. Hoc fulcrum axe suo verticali ac terete, in tubo cylindraceo columnae aeneae circumvertitur, quae columna turbinatim in pedestalis convexobasim desinit, quam totam





draco multiplici sinuosi corporis spirâ circumcingit: Ut vero facilius in omni situ sustineatur, unus ex observatoribus (qui quotidie satis multi sunt) trochleis adhibitis adjuvat, ut in figura exprimitur. Hinc inde a centrali dioptrarum cylindro, erigúntur laterales cy=lindri, pro exiguis stellarum distantijs capiendis, per pinnacidia rimosa more Tychonico.

Figura 7a

Figura 7a globum stelliferum, tamquam omnium instrumentorum compendium exhibet: Ejus diameter sex pedes geometricos adæquat: ejus meridianum binæ trabes æneæ ad angulum rectum decussatæ susti=nent, quæ quidem trabes inferne cum pedestali circulari horizontis minime sunt connexæ: Nam totus horizon cum suo pedestali per tres magnas vites potest attolli ac deprimi, ut scilicet totus horizon sphæram in bina hæmisphæria exacte dividat, quæ vites innituntur cubo æneo intra sectum pavimenti lapi=dem inserto, et habent suum piteolum minoribus vitibus clau=dendum aperiendumque, ut patet in figura numero 2 et 3.
Ut vero præfatus globus ad omnem elevati poli gradum facile attol=latur, meridiani inferioris quadranti, qui a polo sphæræ antarctico incipit, affixus est alius quadrans ferreus, sive quadrantis arcus mul=tiplici dente excavatus, et opere rotatili facillime mobilis, adeo ut vel puer nullo negotio totum globum, cujus pondus 2000 libras superat, possit attollere ad omnem altitudinis gradum. Cujus machi=næ forma magis distincta patet infra, in figura 11 num: 4°

Figura 8

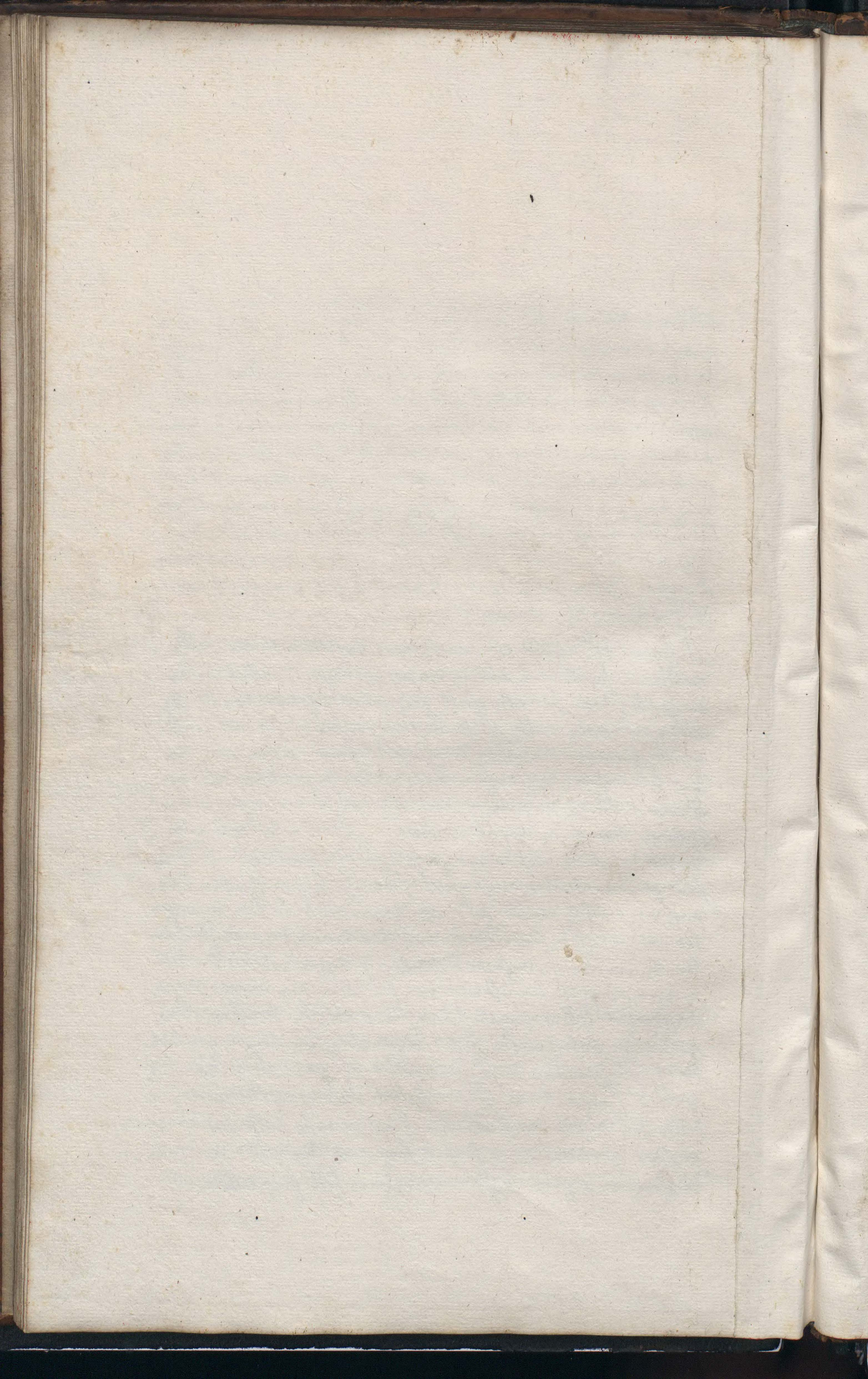
Hæc figura exhibet gradus marmoreos, qui amphitheatri for=mam imitantur, in quorum medio instrumenta præfata collocata sunt; nam qualibet instrumenta habent suos gradus circumpositos, quos exhibent figura 8. 9. 10. 11a
Ex hac rudi instrumentorum adumbratione, et ex libello obser=vationum præmisso, satis argui potest, quam accuratam tota hæc res Astronomiæ perititissimi diligentiam, et lynceos ejus oculos requirat

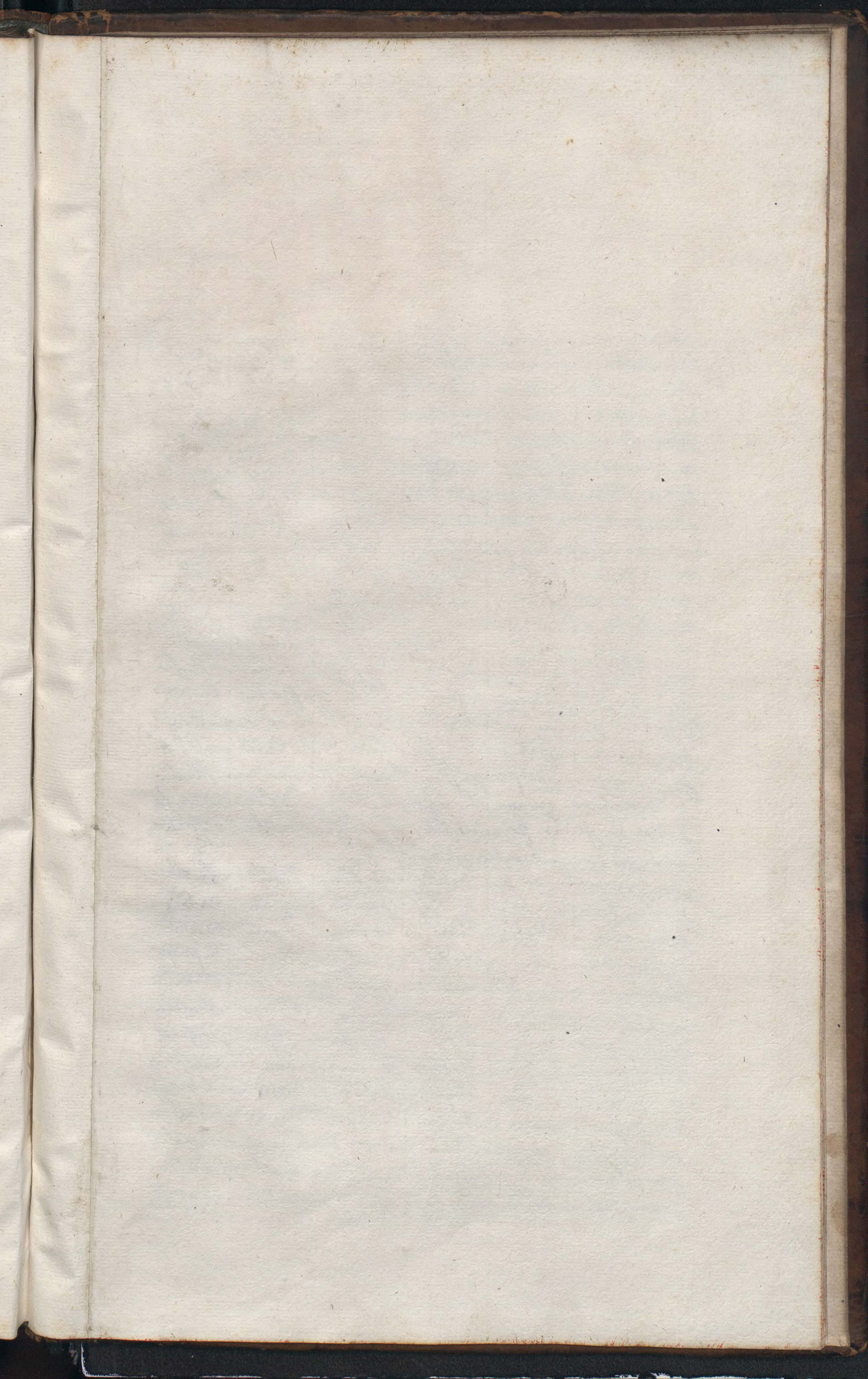
4

nullus ejus difficultatem satis percipere potest, nisi quem ipsa experientia multorum jam annorum admonentem saepe docuit. Certe homines harum rerum imperiti, coram quibus tanquam judicibus, Astronomi hic plerumque caelum observant, si quid inter observandum minus caelo respondere advertant, vitium ejus non fabricae aut directioni instrumentorum, quam scilicet ignorant, imputare solent, sed ipsius Astronomi calculo, tanquam caelo aberranti, imo ipsi Astronomiae Europaeae, tanquam incertae et caelo suo contradicenti: ac nomen periti astronomi, si coram obesis hisce ventribus inter observandum per pauca minuta aberret, plus detrimenti patitur, quam si coram Ptolomaeis et Tychonibus nostris per mediam etiam plus horam caelo aberraret

Imperator ardenti studio ad Mathesim discendam rapitur

A figura 43ia usque ad 55am omnis generis instrumentorum mathematicorum supellectilem abundantem propono, idque ob multas causas, ex quibus una haec est, quod Imperator Tartaro-Sinicus, qui modo gubernat, multa ex iis ad privatum suum usum, ut conficienda curarem, mandavit: quare dignum existimavi, ut in hoc libro, quem ipsi offerebam, omnia in publicam lucem ederem, vel ad perpetuam tanti Monarchae memoriam, qui scilicet, dum a rebus publicis otium aliquod nactus erat, cum magna voluptate illis utendis intelligendisque multum incubuit. Jam quatuor circiter anni elapsi sunt, cum Imperator per 5 et amplius menses continuos, me quotidie in Aulam interiorem, et in ipsum suum Musaeum vocavit, ac totos pene dies detinuit, non alia ex causa, nisi ut ea, quae spectant ad Mathematicam, et praesertim astronomiam per otium inquireret. Primo die protulit libros omnes Astronomicos et alios Mathematicos, quos olim Patres nostri Sinico idiomate scripserunt, qui fere 120 numerantur, et singulos sibi explicari voluit. Ego itaque quotidie summo mane frequentabam Aulam, et statim in Interius Imperatoris conclave admissus, non nisi post meridiem et saepe quidem, non nisi post horam 3iam aut 4tam a meridie, domum repetebam; solus ipse, cum solo Imperatore ad

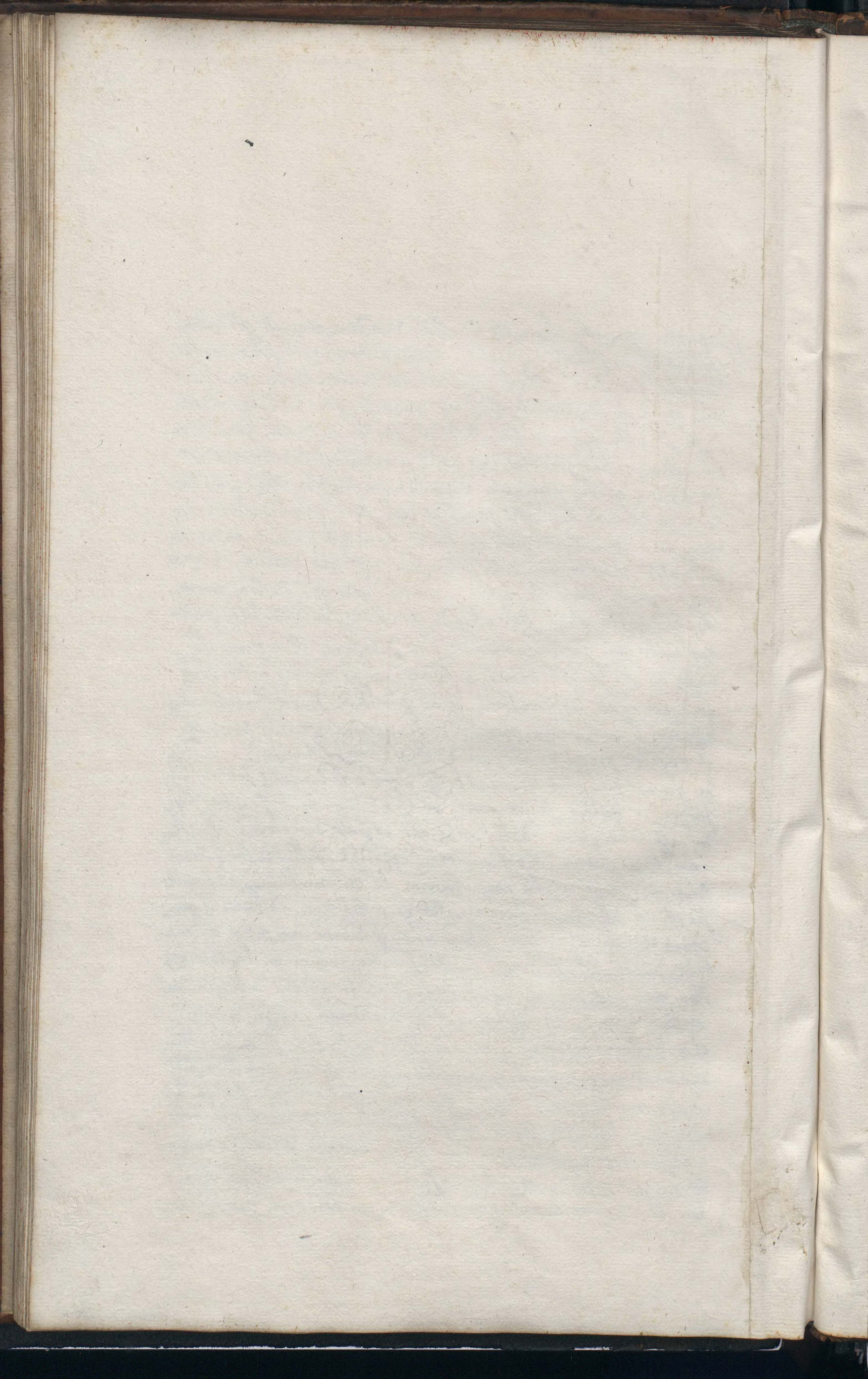


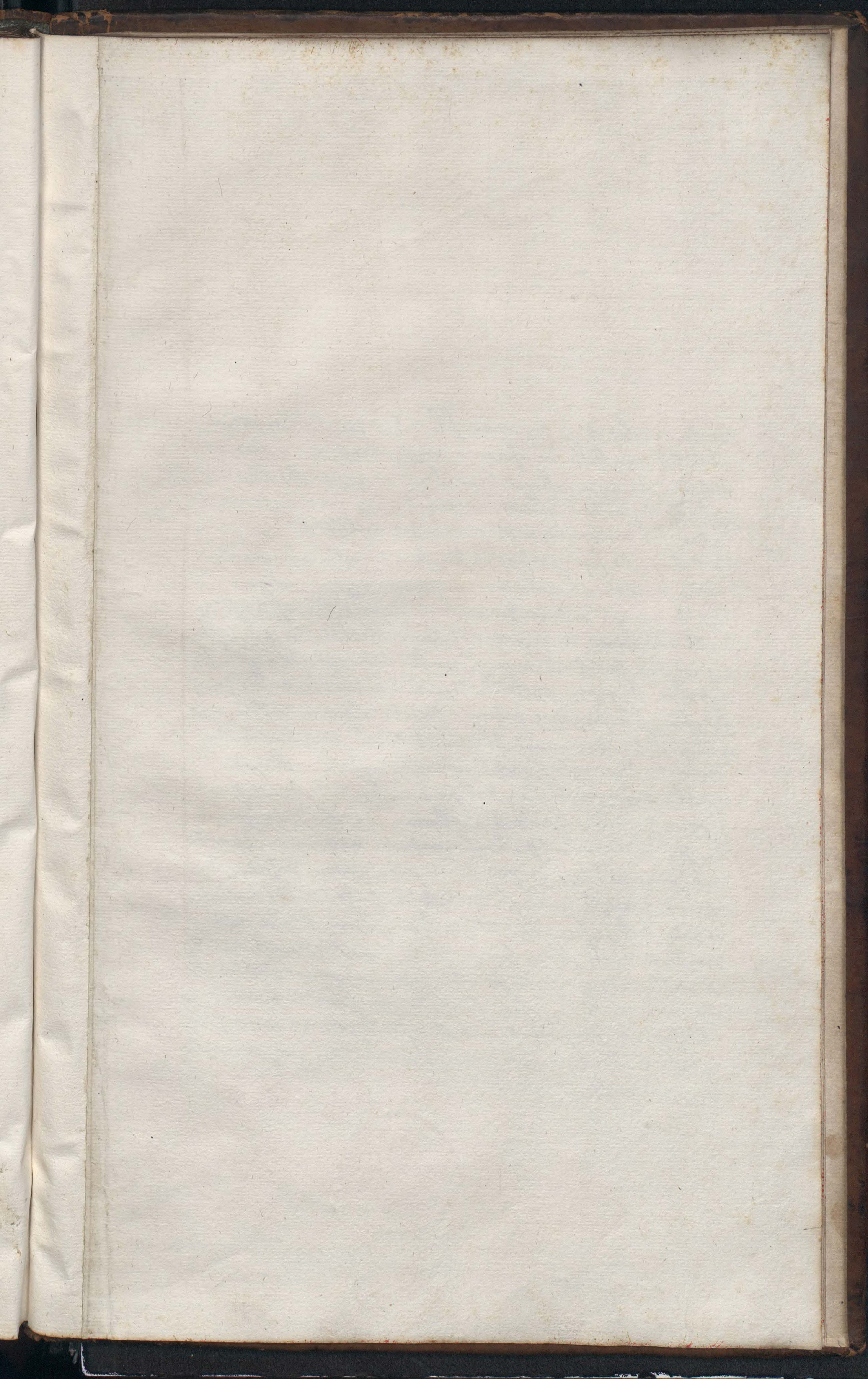


communem Mensam Libros ejusmodi revolvebam explicabamque duo duntaxat alterove ex ephebis astante: tam ardenti subinde studio Imperator in res Astronomicas ferebatur. Quo quidem tempore intra Palatii interioris septa me quotidie prandio lautissimo excipiebat, missis saepe ex ipsa sua mensa ferculis multis in vasis aureis. Atque haec quidem, et alia his similia, quae sequuntur, quam rara sint benevolentiae regiae signa, et quam manifesta animi in exteros alienique indicia, nemo unquam satis percipiet, nisi prius noverit, Imperatorem Sinicum a suis tamquam arcanum aliquod Numen coli, et valde rarum ad illum patere accessum, praesertim hominum exterorum, adeo, ut qui ex remotissimis Regnis, ubi ex Hispania, Moscovia, Holandia aliisque terris huc aliquando venerunt Legati, singulari se favore exceptos judicent, si vel semel in conspectum tantae Majestatis privatim admittantur, eamque, licet ex remotiori loco, libere possint intueri. Imo licet sint Colai aut Reguli sanguine propinquissimi, semper summo cum silentio et veneratione coram illo assistunt, et si quid loquendum sit statim in genua procumbunt, atque ita breviter respondent ad ea, quae interrogat aut imperat.

Cum Imperator ex me intelligeret Libros Euclidis esse elementa praecipua totius Matheseos, statim sex primos Euclidis Libros, olim a P. Mattheo Riccio in idioma Sinicum versos sibi explicari voluit, et a capite usque ad calcem, singularum propositionum mentem, obfirmati et quasi pertinacis (ut Itali loquuntur) animi constantiâ exquisivit, et licet idioma Sinicum optimè calleret, litterasque Sinicas facillima manu pingeret, nihilominus Euclidem Sinicum in Tartaricum idioma verti voluit, ut et hinc aliquod subsidium peteret. Cum magnates passim idiomate Tartarico utantur, illudque in omnibus fere tribunalibus magnum usum habeat, mihi quoque singulari benevolentiâ ex domesticis suis magistrum dedit, qui me linguam Tartaricam doceret, cujus nunc grammaticam composui

Imperator perceptis elementis Euclidis, ut ordine et quasi gradatim
procederet, Arythmeticam, analysin triangulorum, non solum recti-
lineorum sed etiam sphaericorum exponi voluit. Hisce omnibus
tricis et quasi Mathematicae spinis animoso pede calcatis, alacri-
us se ad laetiora convertit, scilicet ad Geometriam practicam
Geodesiam, chorographiam, et alias amoeniores Mathematicae
disciplinas, quibus plurimum delectatus est (nam illa quae spec-
tant ad sphaerae Caelestis simul et terrestris intelligentiam, et
usum, imo et eclipses solis ac lunae, jam ab aliquot annis prae-
miserat) Haec omnia non solum sibi explicari voluit, sed ple-
raque eorum coram se, intra privatos interioris Palatij parie-
tes, et aperto atrio sibi ostendi probarique voluit. Ideo post
explicationem eorum omnium, per integrum fere annum
missis ex Aula ad domum nostram omnis generis artificibus
quidquid erat in Mathematica practica instrumentorum
affabre fieri curavit, exempli gratia omnis generis circinos
et regulos proportionum, quadrantes, radios Astronomicos, quadra-
ta geometrica, pantometra etc. In hisce instrumentis tractandis
Imperator multum se exercuit, et dexteram tanti Imperij scep-
tro assuetam, non dedignatus est regulâ et circino assuefa-
cere. Cum autem Arythmeticam apprime calleret (nam non
solum in varijs regulis proportionum se diu multumque exercuit
sed etiam difficiliora quaedam, ut quae spectant ad radices qua-
dratas et cubicas, nec non ad arcana quaedam ex progressione
tam arythmeticâ quam geometricâ, non nunquam tentaverat)
Non mediocriter sane gavisus est, dum in rerum altitudine
et longitudine per instrumentum metiendâ, et in mappa
chorographica delineandâ animadvertit, calculum suum ad ipsam
rei veritatem et locorum distantiam (quam pertica aut fune, sibi
ipsi non satis fidens explorabat) tam prope accedere. postea ex
mensuris hisce terrestribus ad sublimiora et caelestia ascendit,
atque omnium planetarum tam magnitudinem, quam distantiam
inter se, et a globo terrestri non segniter exquisivit: Imo et mo-
tuum illorum, circulos et gyros, atque omnem theoriam per organa





diversa, et orbes etiam papyraceos sibi voluit demonstrari. Totum autem systema stellarum fixarum, et singularum nomen, ordinem et locum ita animo infixerat (nam aliquot noctes in illis addiscendis consumpserat) ut vel sublatis in cælum oculis quamcumque illarum digito statim monstraret, ac proprio nomine appellaret.

Haec aliquanto fusius prosecutus sum, tum ut ostendam quomodo Astronomia Europea Regales animos primum dignata movere, tum ut eos, qui in hanc Provinciam aliquando successuri sunt, certè admoneam, ne pigeat hujusmodi Mathematices disciplinis mentem simul et manum constanter applicare: quia sicut olim Reges magos stella traxit ad adorandum verum Deum, sic etiam hos Principes extremi Orientis astrorum notitia, potest paulatim ducere ad Astrorum dominum cognoscendum atque adorandum. Ego certe nactus hanc Mathematices explicandæ opportunitatem, multa de Religione nostra interserui: imo ipsemet Imperator sponte sua plurima de illa interrogavit Ex: gr: de Deo Uno, de transmigratione animarum, de animæ immortalitate, de præmio et pœna æterna post hanc vitam, de præceptis decalogi, de Christo passo, de virginitate et votis Religiosorum etc atque hæc quidem audivit et interrogavit vultu plane sereno, et ad omnem clementiam, atque ut ita loquar, quasi ad familiaritatem composito: adeo ut me non raro coram se jusserit sedere, et potum suum Tartaricum dare et alia huc spectantia benevolentiæ signa. Hæc omnia, nisi tali opportunitate hujusmodi principibus nunquam proponi, multo minus explicari poterant.

